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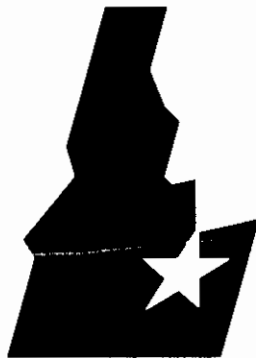


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EFFLUENT INFORMATION SYSTEM (EIS)/ONSITE DISCHARGE INFORMATION SYSTEM (ODIS)

1988 EXECUTIVE SUMMARY

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EFFLUENT INFORMATION SYSTEM (EIS)/ONSITE DISCHARGE INFORMATION SYSTEM (ODIS)
1988 EXECUTIVE SUMMARY

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INTRODUCTION

EIS/ODIS EXECUTIVE SUMMARY - 1988

The Effluent Information System (EIS) and Onsite Discharge Information System (ODIS) are Department of Energy (DOE) data base systems that aid DOE-Headquarters and Field Offices in managing the radioactive air and liquid effluents from DOE facilities. Data on effluents released offsite are entered into EIS and data on effluents discharged onsite and retained onsite are entered into ODIS.

This document is a summary of information obtained from the CY 1988 effluent data received from all DOE and DOE contractor facilities and entered in the data bases. Data from previous years are also included. The summary consists of two parts. The first part summarizes information for effluents released offsite, and the second part summarizes information for effluents retained onsite. These summaries are taken from the routine annual reports sent to each DOE Operations Office. Special tabulations or specific data can be supplied upon request.

Explanations of the significant changes are included in the EIS and ODIS graphic sections. Only those changes in activity greater than a factor of two and having a magnitude greater than 0.1 Ci are considered significant and are addressed in the explanation.

CONTENTS

INTRODUCTION	ii
ACRONYMS & ABBREVIATIONS	vii
1988 EFFLUENT INFORMATION SYSTEM (EIS)	1
EIS EFFLUENT RADIOACTIVITY CHANGES	2
EIS AIRBORNE GRAPHICS	7
EIS LIQUID GRAPHICS	20
EIS TOTAL RADIOACTIVITY RELEASED	31
EIS SELECTED NUCLIDE RELEASES	35
1988 ONSITE DISCHARGE INFORMATION SYSTEM (ODIS)	55
ODIS EFFLUENT RADIOACTIVITY CHANGES	57
ODIS LIQUID GRAPHICS	60
ODIS TOTAL RADIOACTIVITY DISCHARGED	71
ODIS-SELECTED NUCLIDE DISCHARGES	74

FIGURES

1. Total airborne effluent released from all DOE facilities	9
2. Total airborne effluent released from Albuquerque Operations	10
3. Total airborne effluent released from Chicago Operations	11
4. Total airborne effluent released from Idaho Operations	12
5. Total airborne effluent released from Nevada Operations	13
6. Total airborne effluent released from Oak Ridge Operations	14
7. Total airborne effluent released from Pittsburgh N. R. Operations	15
8. Total airborne effluent released from Richland Operations	16
9. Total airborne effluent released from San Francisco Operations	17
10. Total airborne effluent released from Savannah River Operations	18

11. Total airborne effluent released from Schenectady N. R. Operations	19
12. Total liquid effluent released from all DOE facilities	21
13. Total liquid effluent released from Albuquerque Operations	22
14. Total liquid effluent released from Chicago Operations	23
15. Total liquid effluent released from Nevada Operations	24
16. Total liquid effluent released from Oak Ridge Operations	25
17. Total liquid effluent released from Pittsburgh N. R. Operations	26
18. Total liquid effluent released from Richland Operations	27
19. Total liquid effluent released from San Francisco Operations	28
20. Total liquid effluent released from Savannah River Operations	29
21. Total liquid effluent released from Schenectady N. R. Operations	30
22. Plants releasing activity >1.0 Ci in CY88	32
23. Plants releasing C-14 activity >0.1 Ci in CY88	37
24. Plants releasing H-3 activity >100 Ci in CY88	38
25. Plants releasing I-129 activity >0.01 Ci in CY88	39
26. Plants releasing I-131 air activity >0.1 Ci in CY88	40
27. Plants releasing I-131 liquid activity >0.01 Ci in CY88	41
28. Plants releasing Kr-85 air activity >100 Ci in CY88	42
29. Plants releasing Pu-239 air activity >100 Ci in CY88	43
30. Plants releasing Pu air activity >0.001 Ci in CY88	44
31. Plants releasing Pu liquid activity >0.001 Ci in CY88	45
32. Plants releasing Sr-90 liquid activity >0.1 Ci in CY88	46
33. Plants releasing uranium in amounts >10 lb in airborne in CY88	47
34. Plants releasing uranium in amounts >10 lb in liquid in CY88	48

35. Total liquid effluent discharged from all DOE facilities	62
36. Total liquid effluent discharged from Albuquerque Operations	63
37. Total liquid effluent discharged from Chicago Operations	64
38. Total liquid effluent discharged from Idaho Operations	65
39. Total liquid effluent discharged from Nevada Operations	66
40. Total liquid effluent discharged from Oak Ridge Operations	67
41. Total liquid effluent discharged from Richland Operations	68
42. Total liquid effluent discharged from San Francisco Operations ...	69
43. Total liquid effluent discharged from Savannah River Operations	70
44. Plants discharging activity >0.1 Ci in CY88	72
45. Plants discharging Am-241 >0.0001 Ci in liquid in CY88	76
46. Plants discharging Co-60 >0.1 Ci in liquid in CY88	77
47. Plants discharging Cs-137 >0.1 Ci in liquid in CY88	78
48. Plants discharging H-3 >100 Ci in liquid in CY88	79
49. Plants discharging halogens >0.1 Ci in liquid in CY88	80
50. Plants discharging Pu >0.0001 Ci in liquid in CY88	81
51. Plants discharging Pu-238 >0.0001 Ci in liquid in CY88	82
52. Plants discharging Pu-239 >0.0001 Ci in liquid in CY88	83
53. Plants discharging Sr-90 >0.01 Ci in liquid in CY88	84
54. Plants discharging Tc-99 >0.1 Ci in liquid in CY88	85
55. Plants discharging uranium in amounts >10 lb in liquid in CY88	86
56. Plants discharging unidentified alpha >0.001 Ci in liquid in CY88	87
57. Plants discharging unidentified B&G >0.001 Ci in liquid in CY88	88

TABLES

I	Five-Year Summary of Annual Radioactivity Released to the Environment in Curies - EIS (CY 1984-1988)	4
II	Five-Year Summary of Airborne Curies Released to the Environment - EIS (CY 1984-1988)	5
III	Five-Year Summary of Liquid Curies Released to the Environment - EIS (CY 1984-1988)	6
IV	All Plants with Releases Greater than 1 Ci - EIS (CY 1988)	33
V	Isotopic Summary Reports - EIS (CY 1988)	49
VI	Summary of Radioactive Releases - EIS (CY 1988)	54
VII	Five-Year Summary of Annual Radioactivity Discharged to Onsite Storage/Disposal Facilities in Curies - ODIS (CY 1984-1988)	59
VIII	Discharge Points Discharging >1 Ci of Radioactivity During CY 1988 - ODIS	73
IX	Isotopic Discharge Summary Report - ODIS (CY 1988)	89
X	Summary of Onsite Radioactive Liquid Discharges - ODIS (CY 1988)	94
XI	Cumulative Inventories in Active Storage/Disposal Facilities (SDF) (Decayed to 12/31/88) - ODIS	95

ACRONYMS & ABBREVIATIONS

AL	Albuquerque Operations Office
BLIF	Brookhaven LINAC Isotope Facility
CFA	Central Facilities Area
CH	Chicago Operations Office
Ci	Curies
CY	Calendar Year
DOE	Department of Energy
EIS	Effluent Information System
ICPP	Idaho Chemical Processing Plant
ID	Idaho Operations Office
INEL	Idaho National Engineering Laboratory
ITRI	Inhalation Toxicology Research Institute
L	Liters
LANL	Los Alamos National Laboratory
LAMPF	Los Alamos Meson Physics Facility
LINAC	Linear Accelerator
m ³	Cubic Meters
NAL	National Accelerator Laboratory
NR	Naval Reactors
NRF	Naval Reactors Facility
NTS	Nevada Test Site
NV	Nevada Operations Office
ODIS	Onsite Discharge Information System
OES	DOE-Headquarters Operational and Environmental Safety Division
OR	Oak Ridge Operations Office
ORGDP	Oak Ridge Gaseous Diffusion Plant

ORNL	Oak Ridge National Laboratory
PBF	Power Burst Facility
PGDP	Paducah Gaseous Diffusion Plant
PNR	Pittsburgh Naval Reactors Operations Office
RL	Richland Operations Office
SDF	Storage/Disposal Facility
SF	San Francisco Operations Office
SNR	Schenectady Naval Reactor Operations Office
SR	Savannah River Operations Office
SRP	Savannah River Plant
TRA	Test Reactor Area

EFFLUENT INFORMATION SYSTEM

This section summarizes the Effluent Information System (EIS) data for CY 1988.

Table I is a summary of the combined total radioactivity (liquid and airborne) released offsite by each Operations Office for the years 1984-1988.

Table II and Table III are similar to Table I, but list separately (by each Operations Office) the released airborne curies and the released liquid curies for the past five years. These data are also presented graphically in Figures 1 through 21. The details on the contributions of individual facilities to their Operations Office total are presented in Table IV.

Table IV lists each plant that released greater than 1 Ci of radioactivity to the environment in 1988. There are 7 plants whose combined releases account for over 99% of the total Department of Energy (DOE) radioactivity released for 1988. These plants are: Los Alamos National Laboratory (Los Alamos) 10.03%, Mound Laboratory (Miamisburg) 0.24%, Lawrence Livermore National Laboratory 0.30%, Idaho Chemical Processing Plant (INEL) 12.93%, 200 East (Richland) 14.90%, Oak Ridge National Laboratory (Oak Ridge) 2.98%, and Savannah River Plant (Savannah River) 57.67%.

Table V lists the releases of preselected radioisotopes reported in the CY 1988 releases. These data are grouped into subtables according to nuclide, and the facilities that released a significant quantity of that radionuclide. The radionuclides reported in Table V and the significant reporting quantities were preselected by DOE-Headquarters, Operational and Environmental Safety Division (OES).

Table VI summarizes the volume and radioactivity for both airborne and liquid effluents released in CY 1988 for each Operations Office. The DOE total for airborne effluent volume was $1.466 \times 10^{11} \text{ m}^3$ containing a $1.299 \times 10^6 \text{ Ci}$; for liquid effluent volume, the total was $1.050 \times 10^{12} \text{ L}$ containing $2.113 \times 10^4 \text{ Ci}$.

EFFLUENT INFORMATION SYSTEM (EIS)
EFFLUENT RADIOACTIVITY CHANGES

A summary of effluent radioactivity changes, by Operations Office, follows: (Data are contained in Tables I - III)

Albuquerque Operations

The Albuquerque Operations airborne effluent radioactivity released to the environment in 1988 showed a decrease compared to 1987. This decrease is due mainly to decrease in airborne radioactivity released by the Los Alamos Meson Physics Facility (LAMPF).

San Francisco Operations

The San Francisco Operations airborne effluent radioactivity released to the environment in 1988 showed an increase compared to 1987. The increase is due mainly to increase in airborne radioactivity released by Lawrence Livermore National Laboratory.

Chicago Operations

The Chicago Operations radioactivity released to the environment in 1988 showed a decrease both in airborne and liquid radioactivity released compared to 1987. The decrease in airborne radioactivity released is the result of decrease in radioactivity released by Argonne National Laboratory (Chicago). The decrease in liquid radioactivity is the result of decrease in liquid radioactivity released by Battelle Columbus.

Idaho Operations

The Idaho Operations airborne effluent radioactivity released to the environment in 1988 showed a decrease from 1987. The decrease is the result of operational change at the Idaho Chemical Processing Plant. The increase from 1986 to 1987 is the result of increased processing of spent government nuclear fuel at the FAST facility.

Nevada Operations

The Nevada Operations airborne effluent radioactivity released to the environment in 1988 showed a decrease compared to 1987. This decrease is due to reduction of releases from the Test Tunnel at NTS.

Oak Ridge Operations

The Oak Ridge Operations airborne and liquid radioactivity released to the environment in 1988 showed a decrease in both in 1988 compared to 1987. The decrease in airborne radioactivity is due to decrease in source production at ORNL. The decrease in liquid radioactivity released from White Oak Dam is due to the drought which reduced liquid discharges into White Oak Dam.

Richland Operations

The Richland Operations airborne radioactivity released to the environment showed an increase in 1988 compared to 1987. The increase in airborne radioactivity is the result of increased Purex operation. The decrease in liquid radioactivity is due mainly to reduced release from the N Reactor which is on standby status.

Savannah River Operations

The Savannah River Operations airborne radioactivity released to the environment in 1988 showed a decrease in both airborne and liquid radioactivity compared to 1987. Both decreases are the result of reduced operation of the processing plants.

Naval Reactors

Both Pittsburgh and Schenectady Naval Reactors Operations airborne and liquid effluent radioactivity released to the environment in 1988 were within limits considered normal by the respective operations office.

TABLE I

FIVE-YEAR SUMMARY OF ANNUAL RADIOACTIVITY RELEASED TO THE ENVIRONMENT IN CURIES - EIS
(CY 1984-1988)

Operations Office											
<u>Year</u>	<u>AL</u>	<u>SF</u>	<u>CH</u>	<u>ID</u>	<u>NV</u>	<u>OR</u>	<u>PNR</u>	<u>RL</u>	<u>SR</u>	<u>SNR</u>	<u>DOE TOTAL</u>
1984	755,699	7,931	20,323	4,592	1,885	127,849	2	487,428	1,662,374	1	3,068,076
1985	140,838	2,533	7,387	76,389	914	62,807	1	773,914	1,371,397	1	2,436,174
1986	127,726	1,507	9,582	13,556	36,129	95,980	1	658,041	1,262,587	2	2,205,109
1987	311,172	3,120	9,797	254,082	209	73,759	1	76,002	1,132,877	4	1,861,019
1988	137,579	4,587	7,238	173,322	94	39,380??	1	196,786	761,466	6	1,320,453

NOTE: Details may not add up due to rounding.

TABLE III

FIVE-YEAR SUMMARY OF LIQUID CURIES RELEASED TO THE ENVIRONMENT - EIS
(CY 1984-1988)

Operations Office										
<u>Year</u>	<u>AL</u>	<u>SF</u>	<u>CH</u>	<u>NV</u>	<u>OR</u>	<u>PNR</u>	<u>RL</u>	<u>SR</u>	<u>SNR</u>	<u>DOE TOTAL</u>
1984	10	2	39	-	6,435	0	171	33,288	0	39,946
1985	10	4	9	-	3,724	0	297	24,429	0	28,471
1986	7	2	6	-	2,610	0	233	27,822	0	30,679
1987	6	2	14	-	2,509	0	102	22,586	0	25,219
1988	5	2	8	-	1,711	0	67	19,338	0	21,131

NOTE: Details may not add up due to rounding.

EFFLUENT INFORMATION SYSTEM (EIS)

AIRBORNE GRAPHICS

Explanations of significant changes in the data reported graphically follow:

The airborne release graph for Albuquerque Operations Office (Figure 2) shows a decrease in radioactivity released in 1988 compared to 1987. The decrease is due to reduced operation of the Linear Accelerator (LINAC) at the LAMPF.

The airborne release graph for Chicago Operations Office (Figure 3) shows a decrease in radioactivity released in 1988 compared to 1987. Much of the reduction is due to improved management of short half-life isotopes before release by Argonne National Laboratory (Chicago).

The airborne release graph for Idaho Operations Office (Figure 4) shows a decrease in radioactivity released in 1988 compared to 1987. This decrease is the result of operational change at the Idaho Chemical Processing Plant. The increase noted from 1986 to 1987 is the result of increased processing of spent government fuel at the FAST facility.

The airborne release graph for Nevada Operations Office (Figure 5) shows a decrease in radioactivity released in 1988 compared to 1987. This decrease is the result of locating and sealing off sources of emission in the U12G Tunnel at NTS.

The airborne release graph for Oak Ridge Operations Office (Figure 6) shows a decrease in radioactivity released in 1988 compared to 1987. Much of this reduction is attributable to decrease in source production at Oak Ridge National Laboratory and to High Intensity Flux Reactor (HIFR) not operating in 1988.

The airborne release graph for the Richland Operations Office (Figure 8) shows an increase in radioactivity released in 1988 compared to 1987. Much of this increase is due to increase in processing at the Purex Plant in 1988.

The airborne release graph for the San Francisco Operations Office (Figure 9) shows an increase in radioactivity released in 1988 compared to 1987. Much of this increase is attributable to increased release by the light isotope facility at Lawrence Livermore National Laboratory (LLNL).

The airborne release graph for the Savannah River Operations Office (Figure 10) shows a decrease in radioactivity released in 1988 compared to 1987. This decrease is the result of reduced processing operation in 1988.

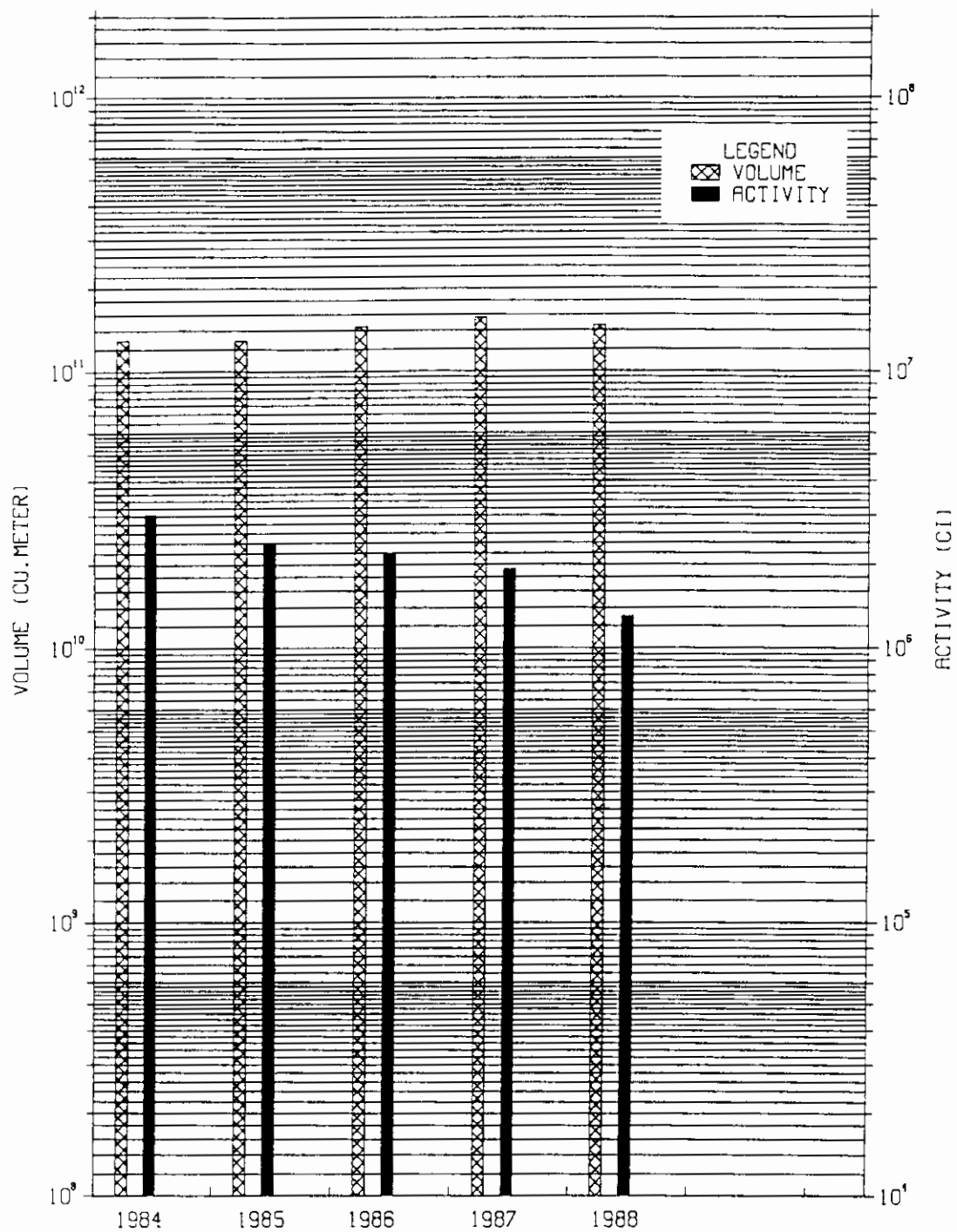


FIG. 1 TOTAL AIRBORNE EFFLUENT RELEASED FROM ALL DOE FACILITIES.

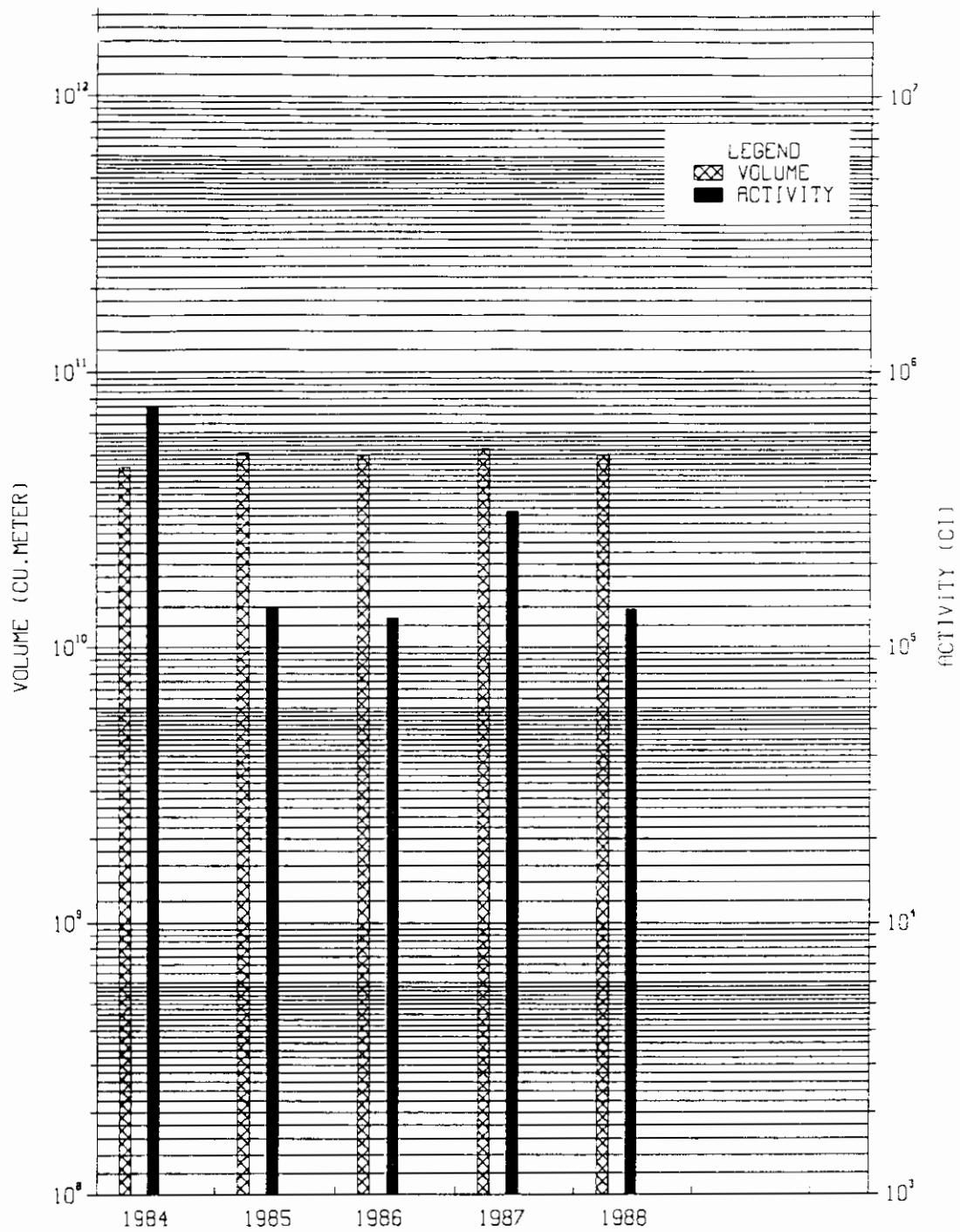


FIG. 2 TOTAL AIRBORNE EFFLUENT RELEASED FROM ALBUQUERQUE OPERATIONS.

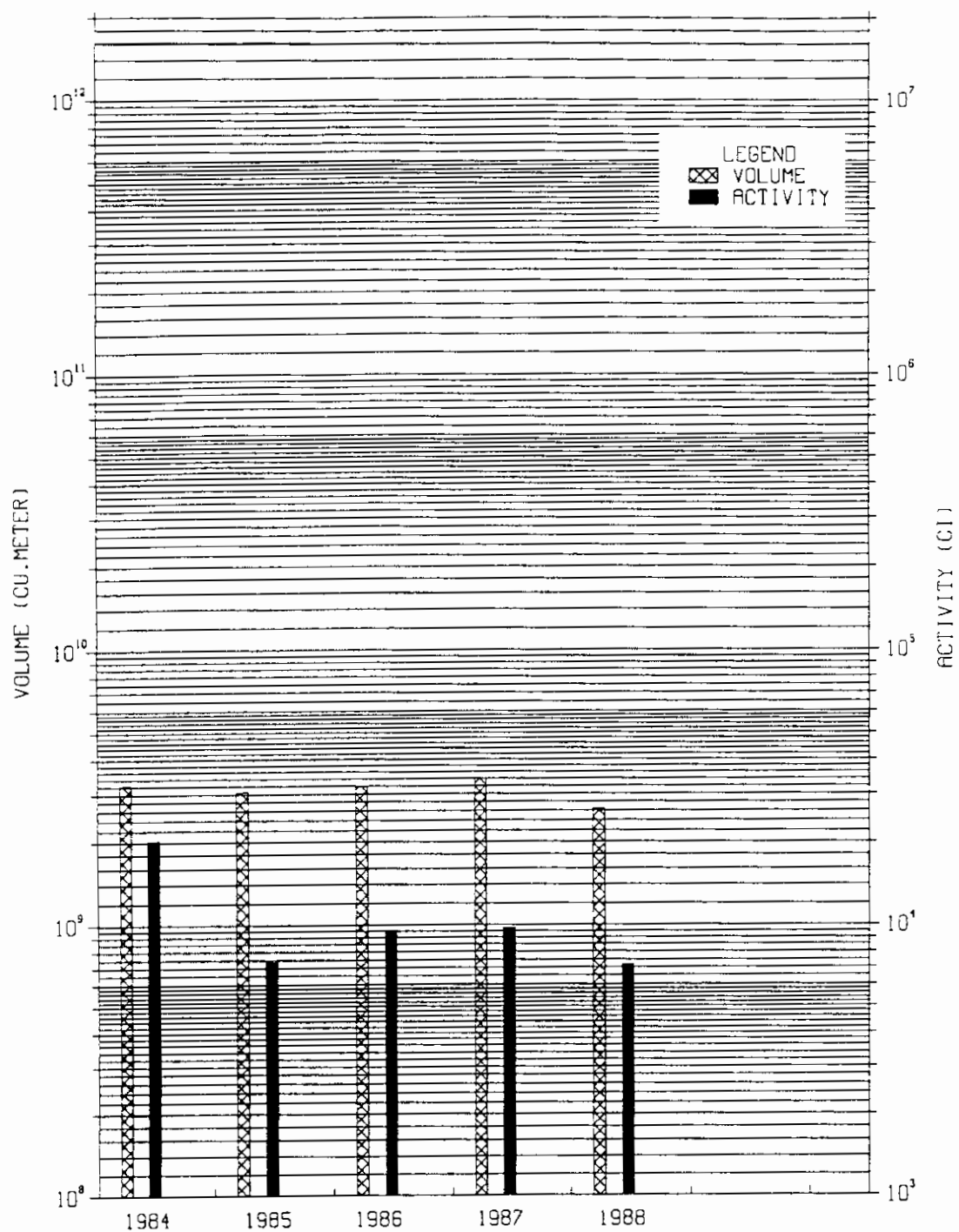


FIG. 3 TOTAL AIRBORNE EFFLUENT RELEASED FROM CHICAGO OPERATIONS.

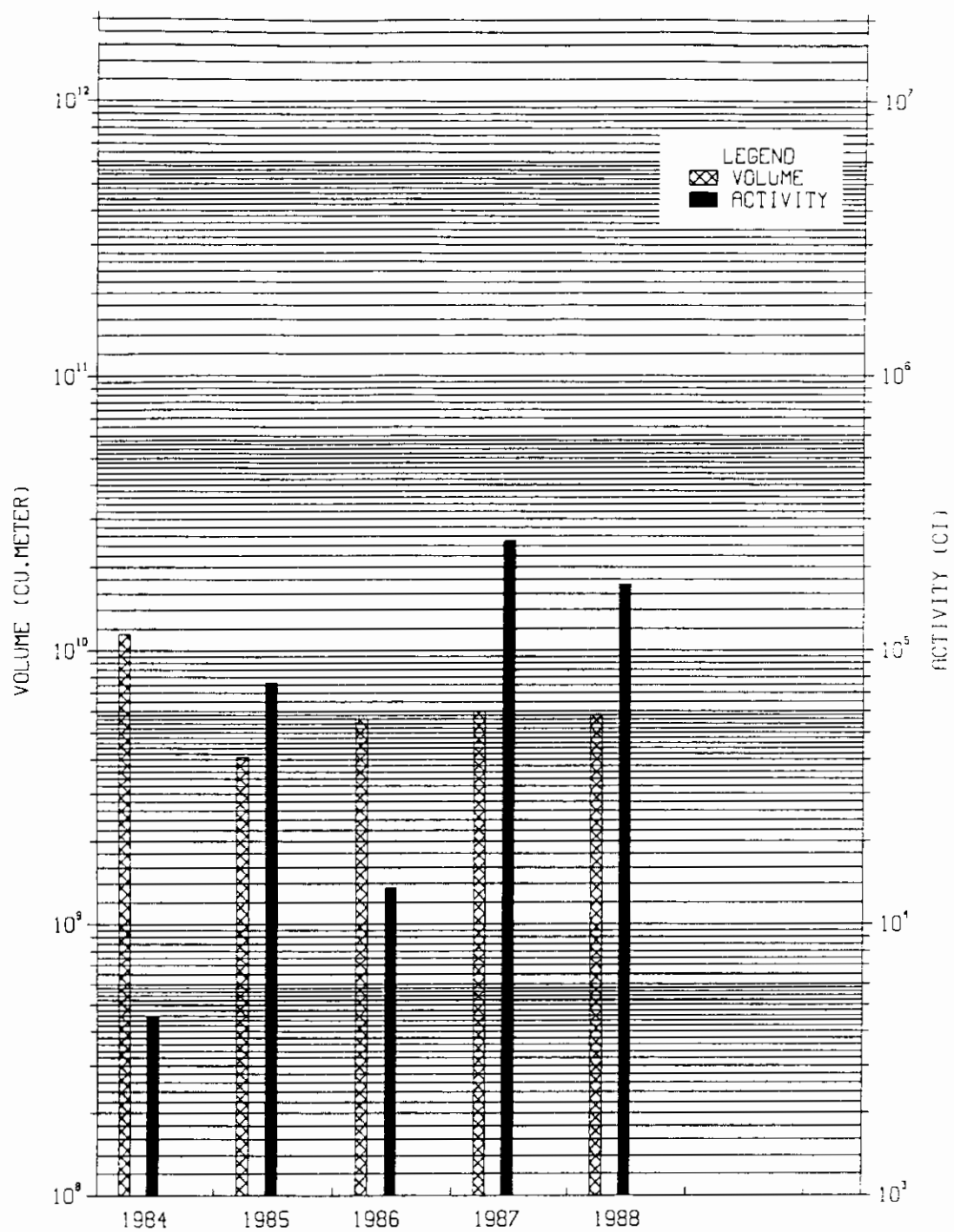


FIG. 4 TOTAL AIRBORNE EFFLUENT RELEASED FROM IDAHO OPERATIONS.

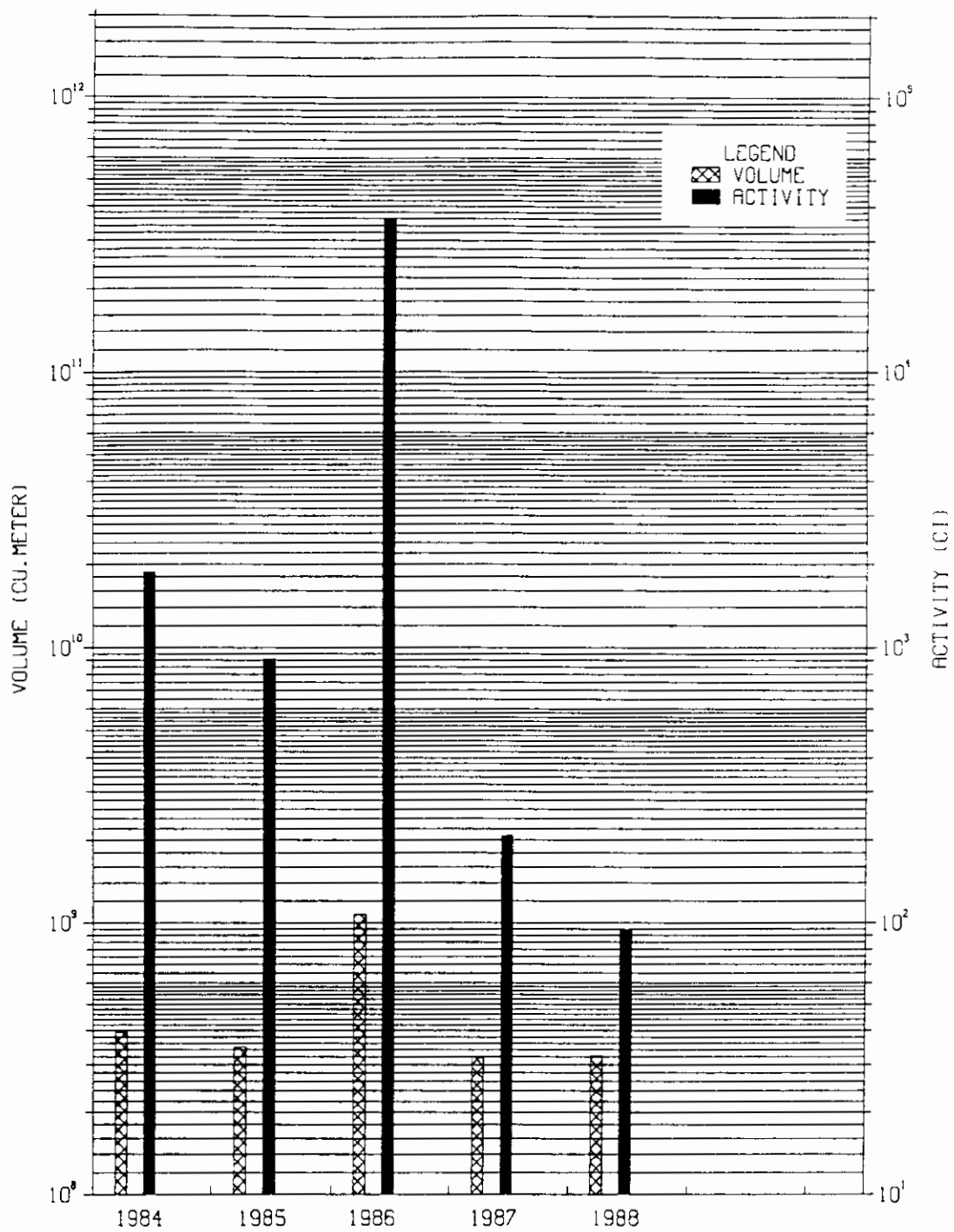


FIG. 5 TOTAL AIRBORNE EFFLUENT RELEASED FROM NEVADA OPERATIONS.

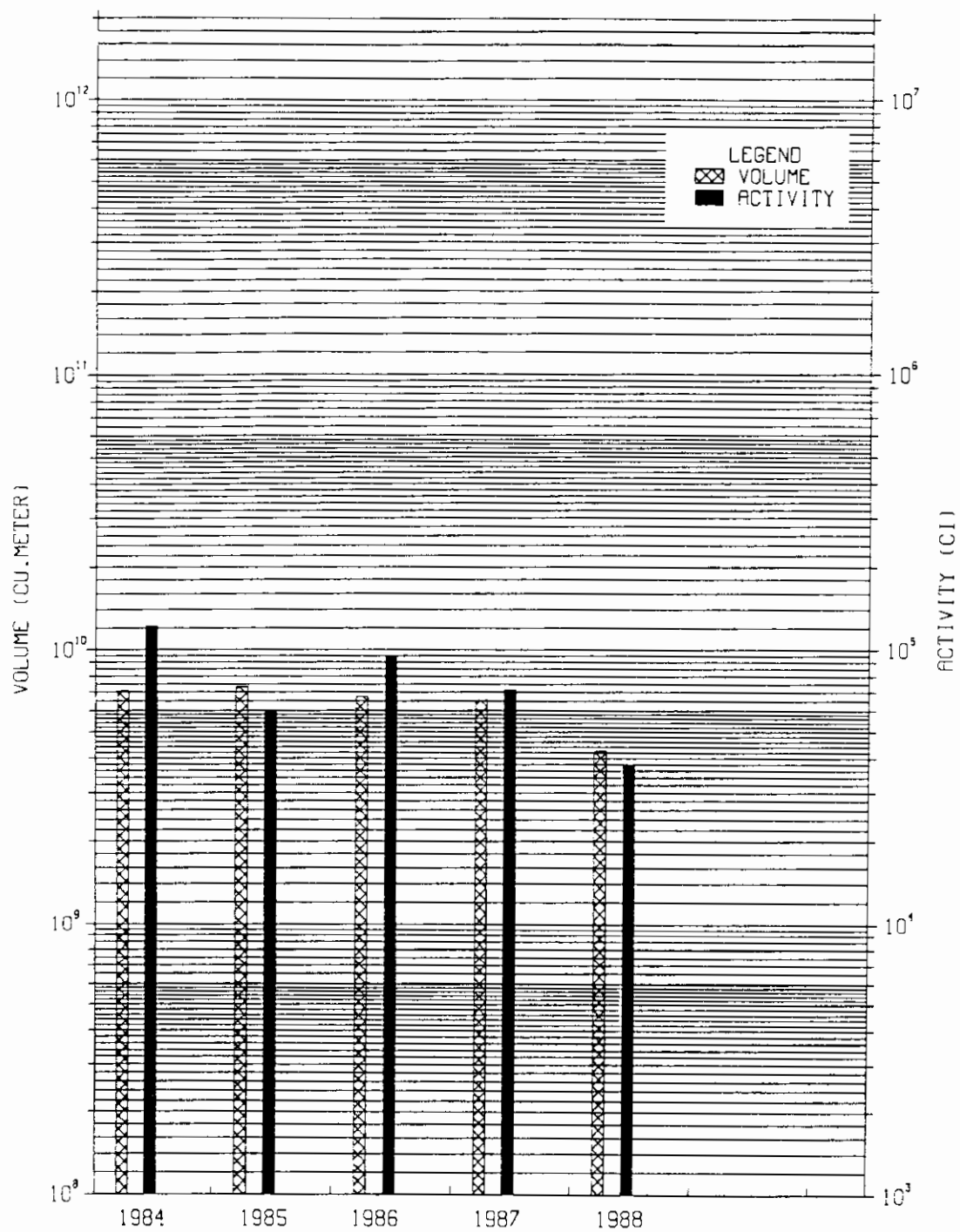


FIG. 6 TOTAL AIRBORNE EFFLUENT RELEASED FROM OAK RIDGE OPERATIONS.

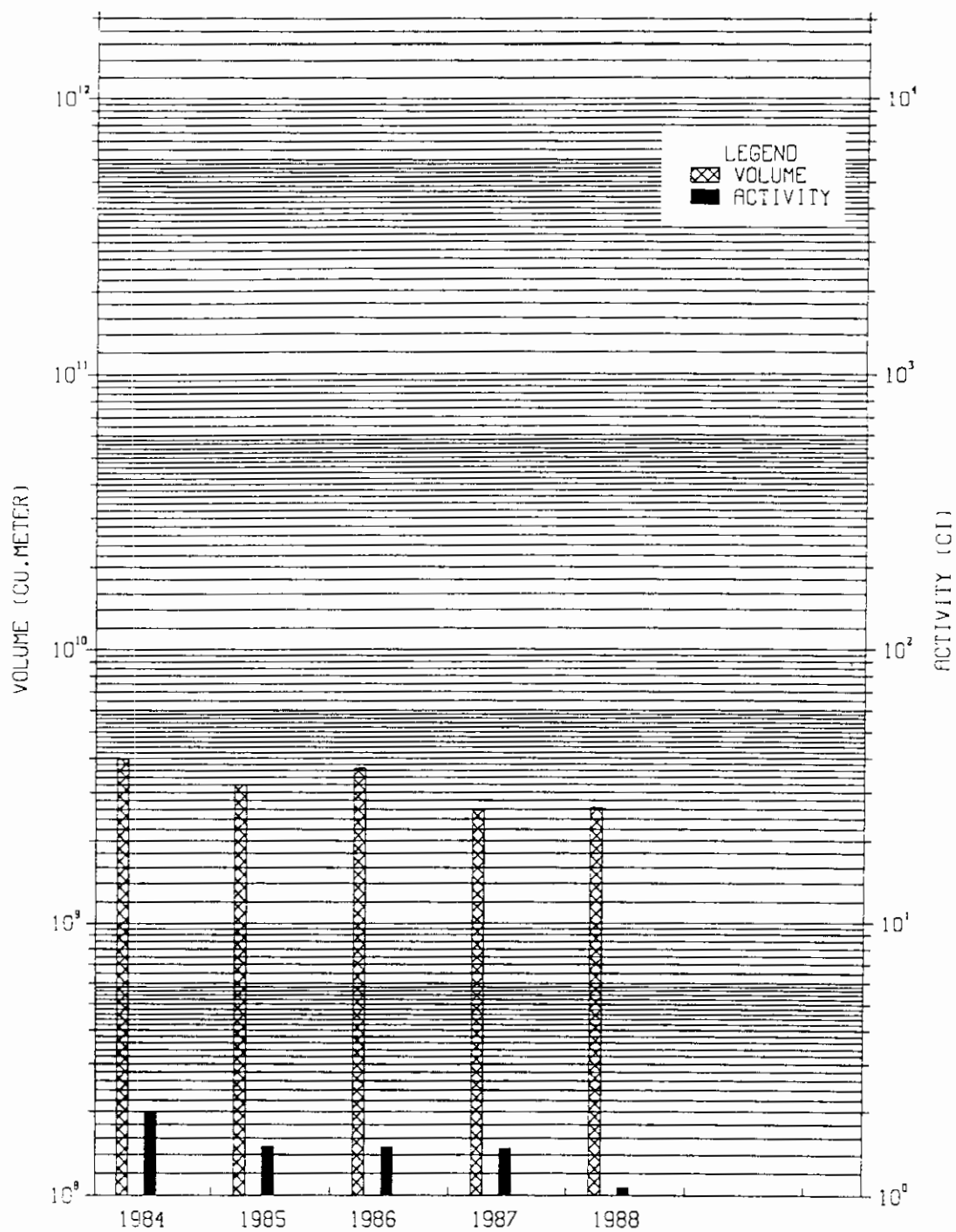


FIG. 7 TOTAL AIRBORNE EFFLUENT RELEASED FROM PITT. N. R. OPERATIONS.

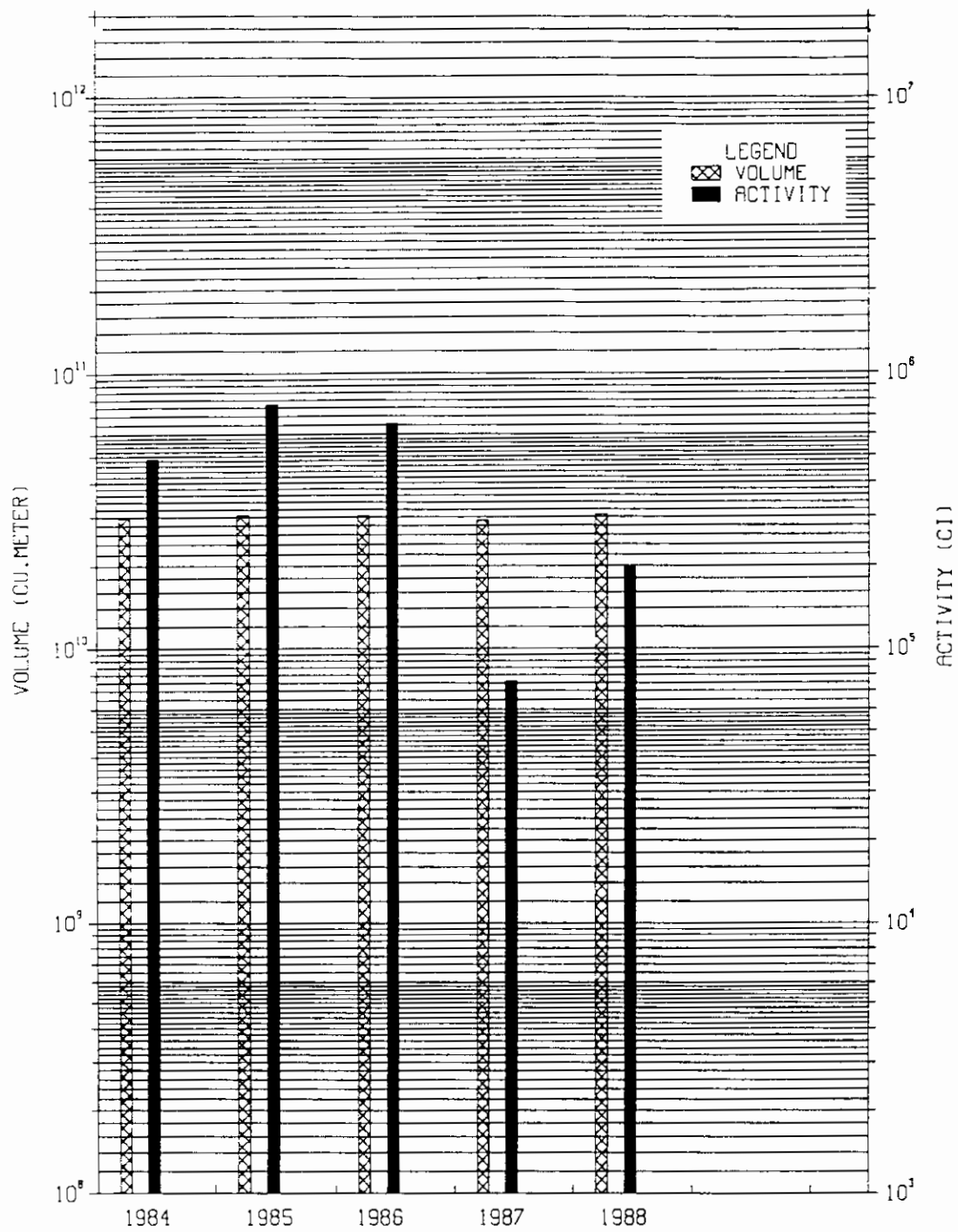


FIG. 8 TOTAL AIRBORNE EFFLUENT RELEASED FROM RICHLAND OPERATIONS.

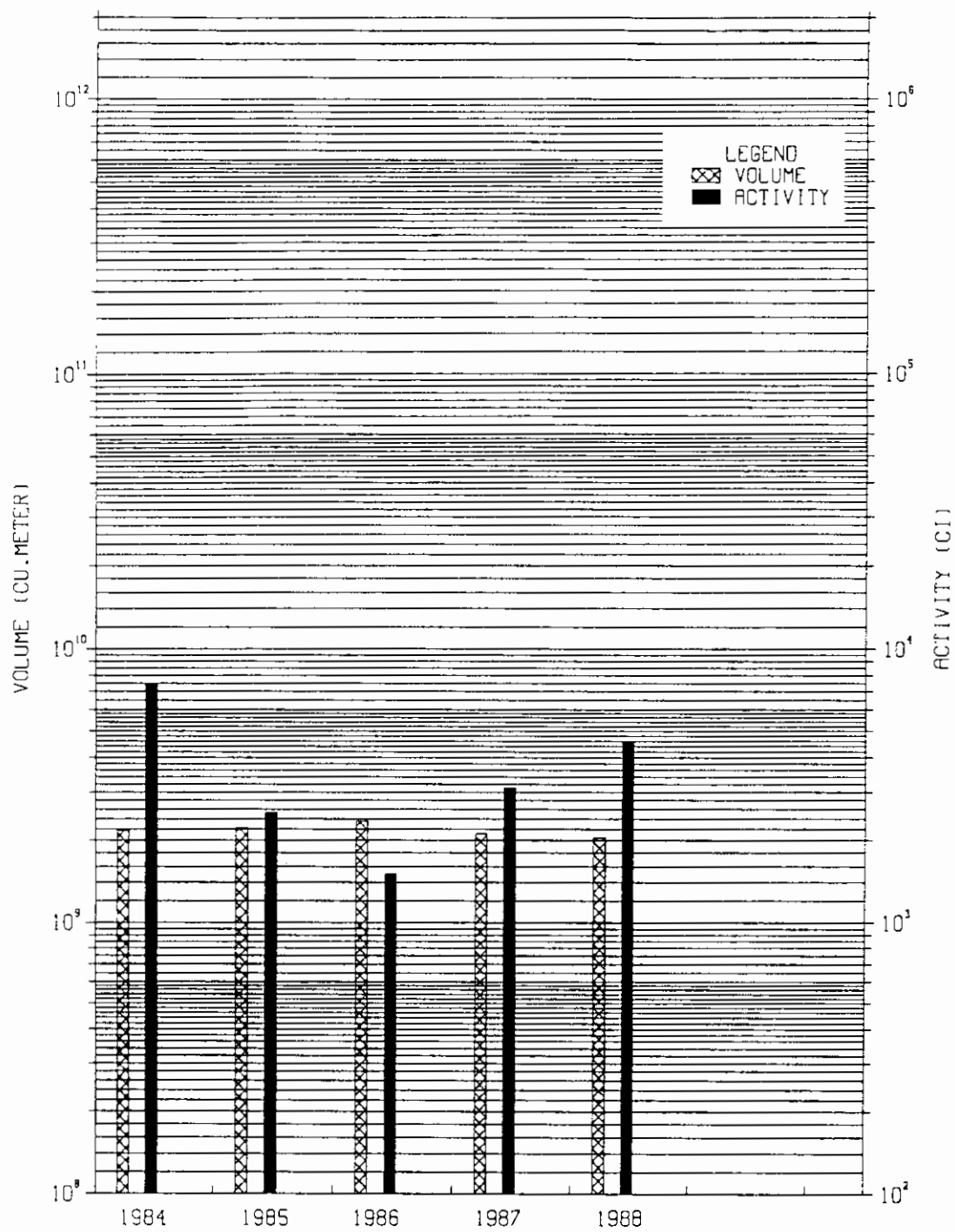


FIG. 9 TOTAL AIRBORNE EFFLUENT RELEASED FROM SAN FRANCISCO OPERATIONS.

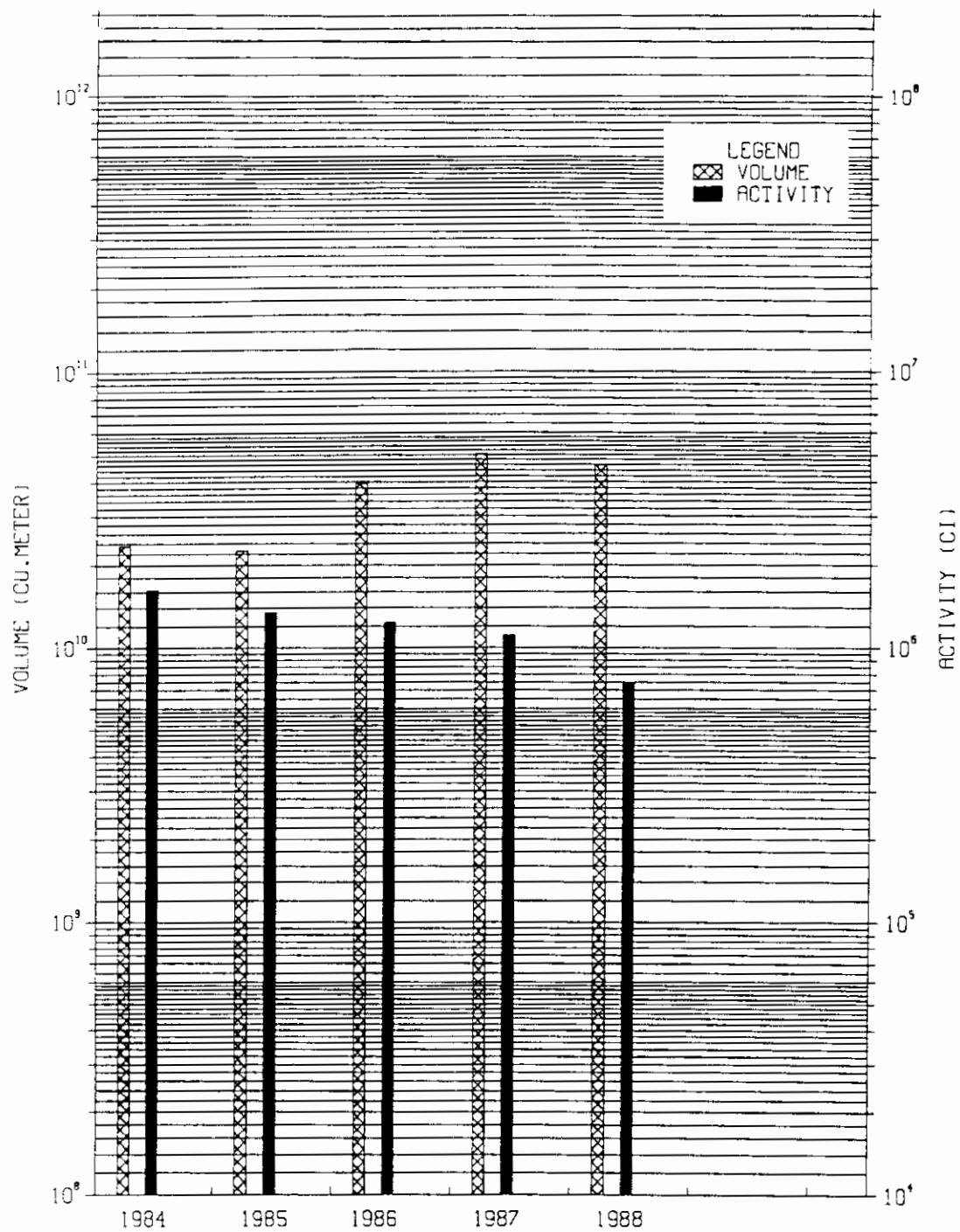


FIG. 10 TOTAL AIRBORNE EFFLUENT RELEASED FROM SAVANNAH R. OPERATIONS.

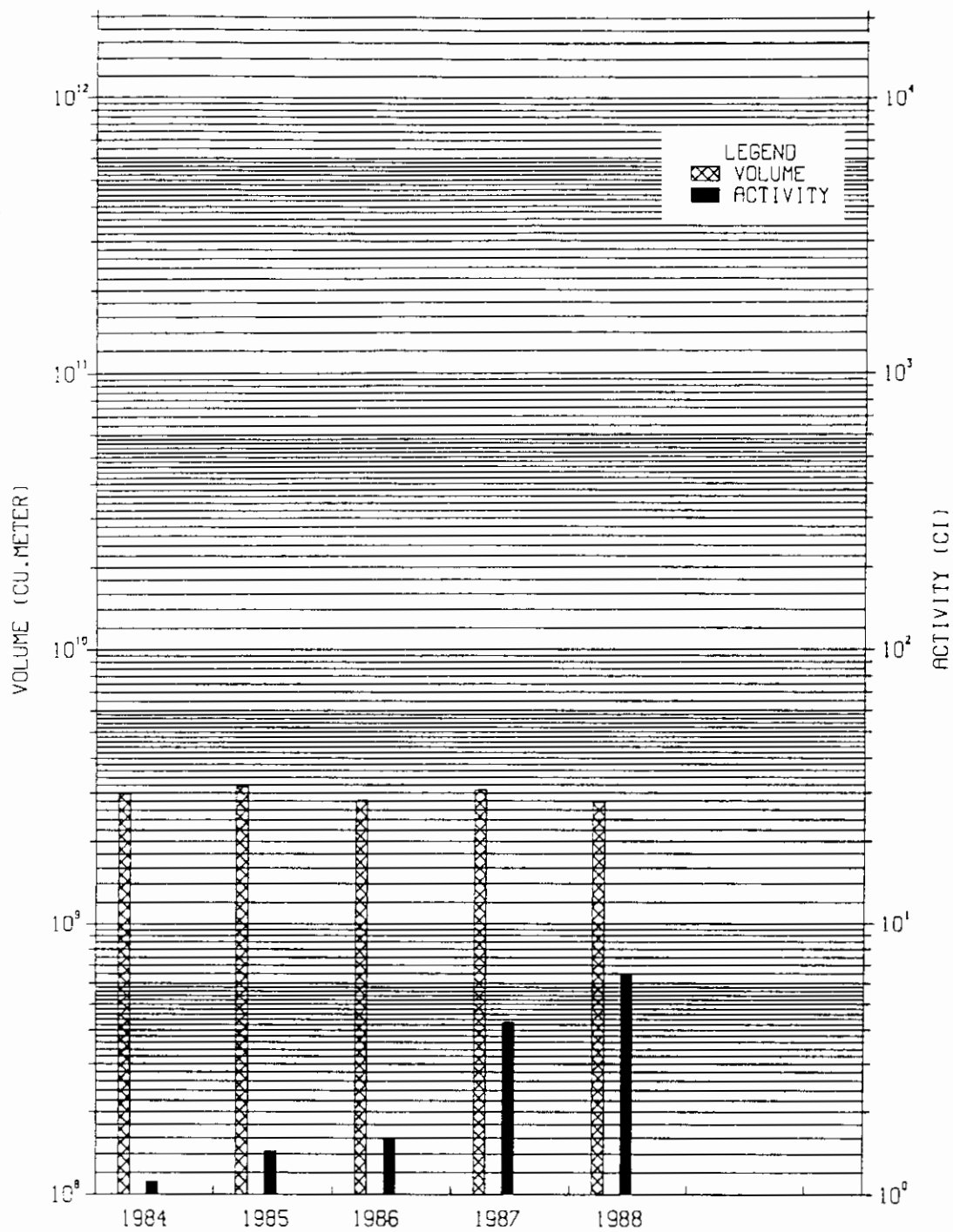


FIG. 11 TOTAL AIRBORNE EFFLUENT RELEASED FROM SCHEN. N. R. OPERATIONS.

EFFLUENT INFORMATION SYSTEM (EIS)
LIQUID GRAPHICS

Explanations of the significant changes in data reported graphically follow:

The liquid release graph for the Chicago Operations Office (Figure 14) shows decrease in liquid volume and radioactivity released in 1988 compared to 1987. The reduction in radioactivity released is due primarily to decrease in radioactivity released by Battelle Columbus.

The liquid release graph for the Oak Ridge Operations Office (Figure 16) shows a decrease in liquid radioactivity released in 1988 compared to 1987. The decrease in liquid radioactivity release is due to reduced release from White Oak Lake. The reduction is attributable to the drought which reduced the liquid flow into White Oak Lake from various sites at Oak Ridge.

The liquid release graph for the Richland Operations Office (Figure 18) shows a decrease in liquid radioactivity released in 1988 compared to 1987. This decrease is due primarily to the N Reactor being placed on a standby mode at the beginning of 1988.

The liquid release graph for the Savannah River Operations Office (Figure 20) shows a decrease in the liquid radioactivity released in 1988 compared to 1987. This decrease is the result of reduction in process operation in 1988.

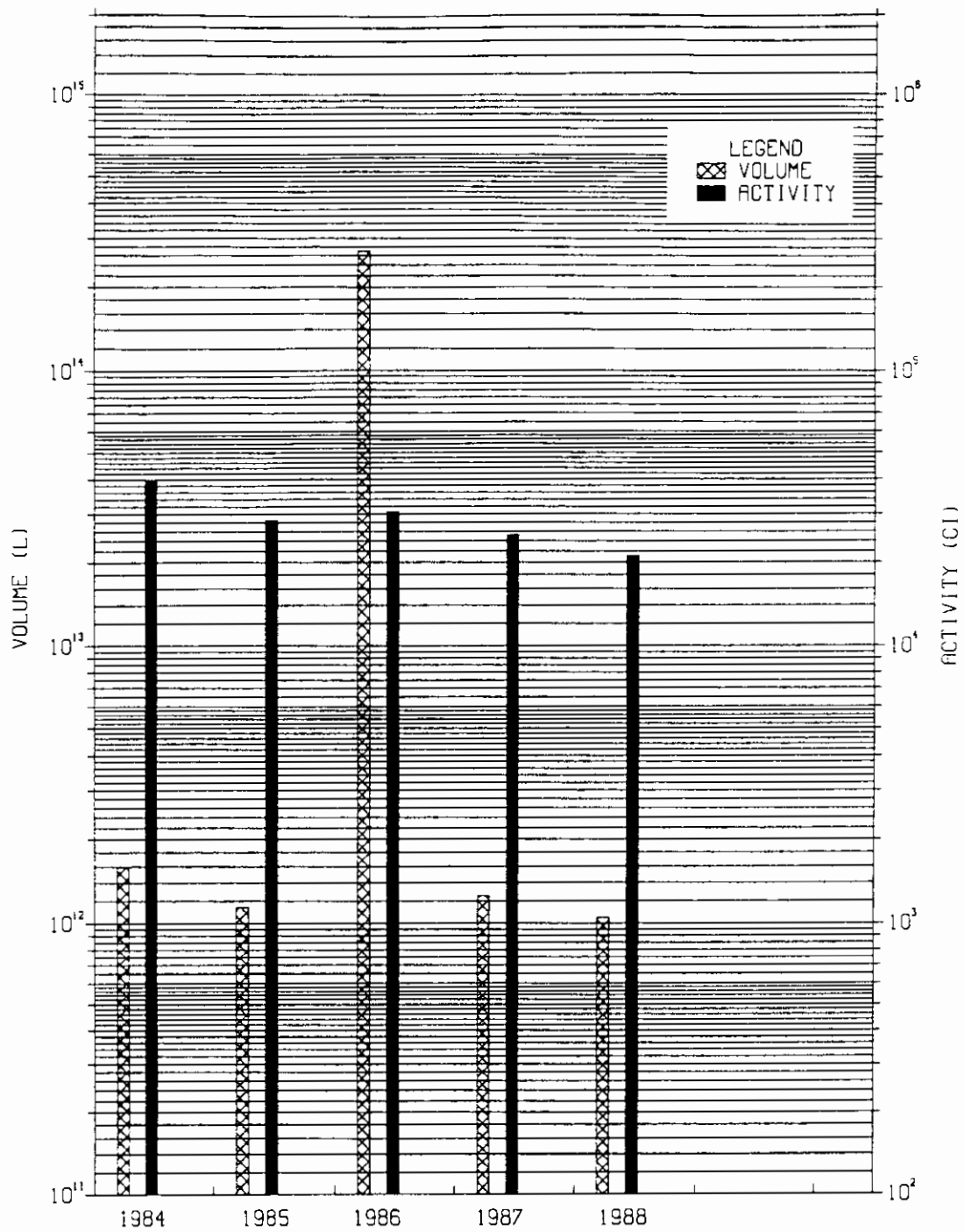


FIG. 12 TOTAL LIQUID EFFLUENT RELEASED FROM ALL DOE FACILITIES.

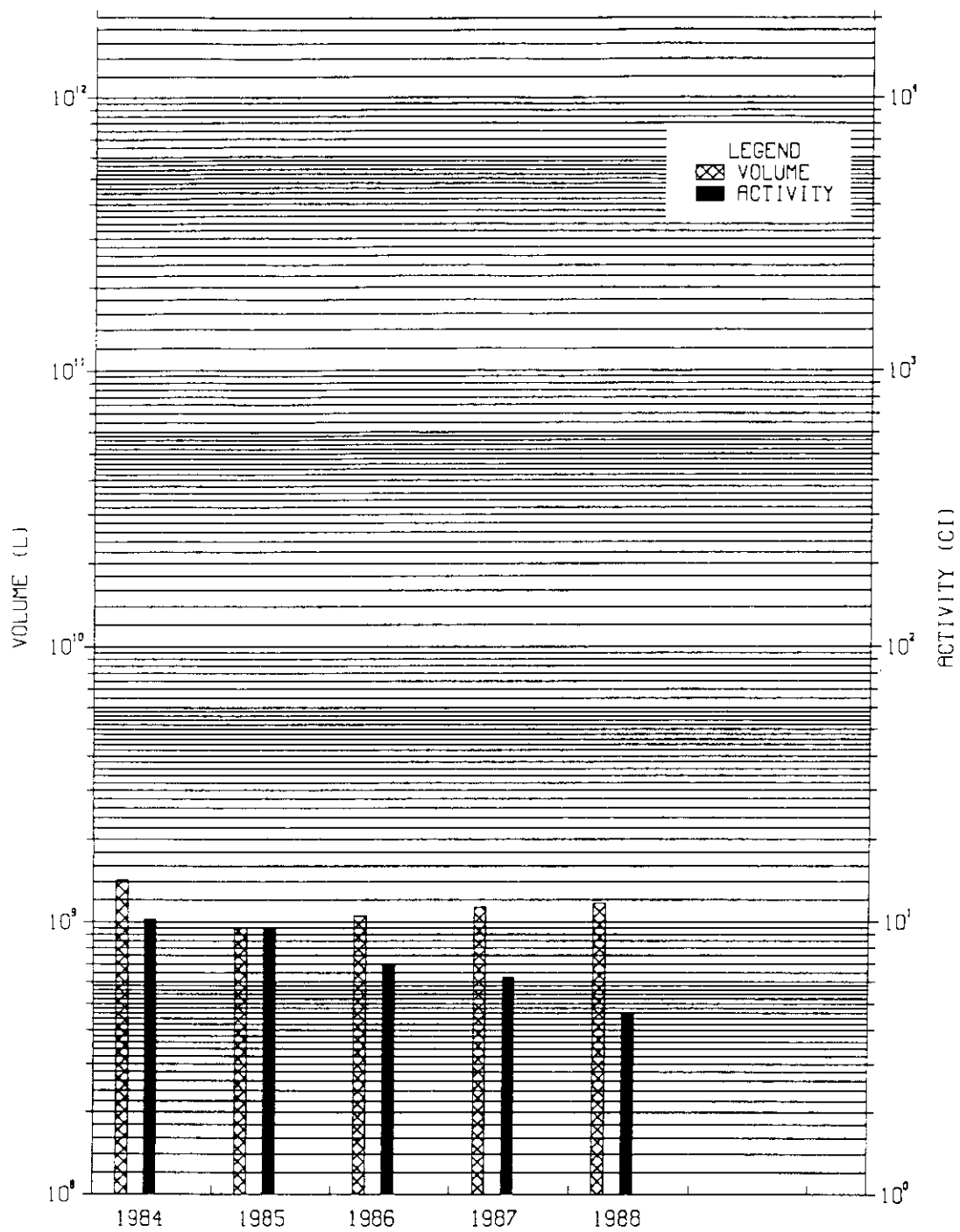


FIG. 13 TOTAL LIQUID EFFLUENT RELEASED FROM ALBUQUERQUE OPERATIONS.

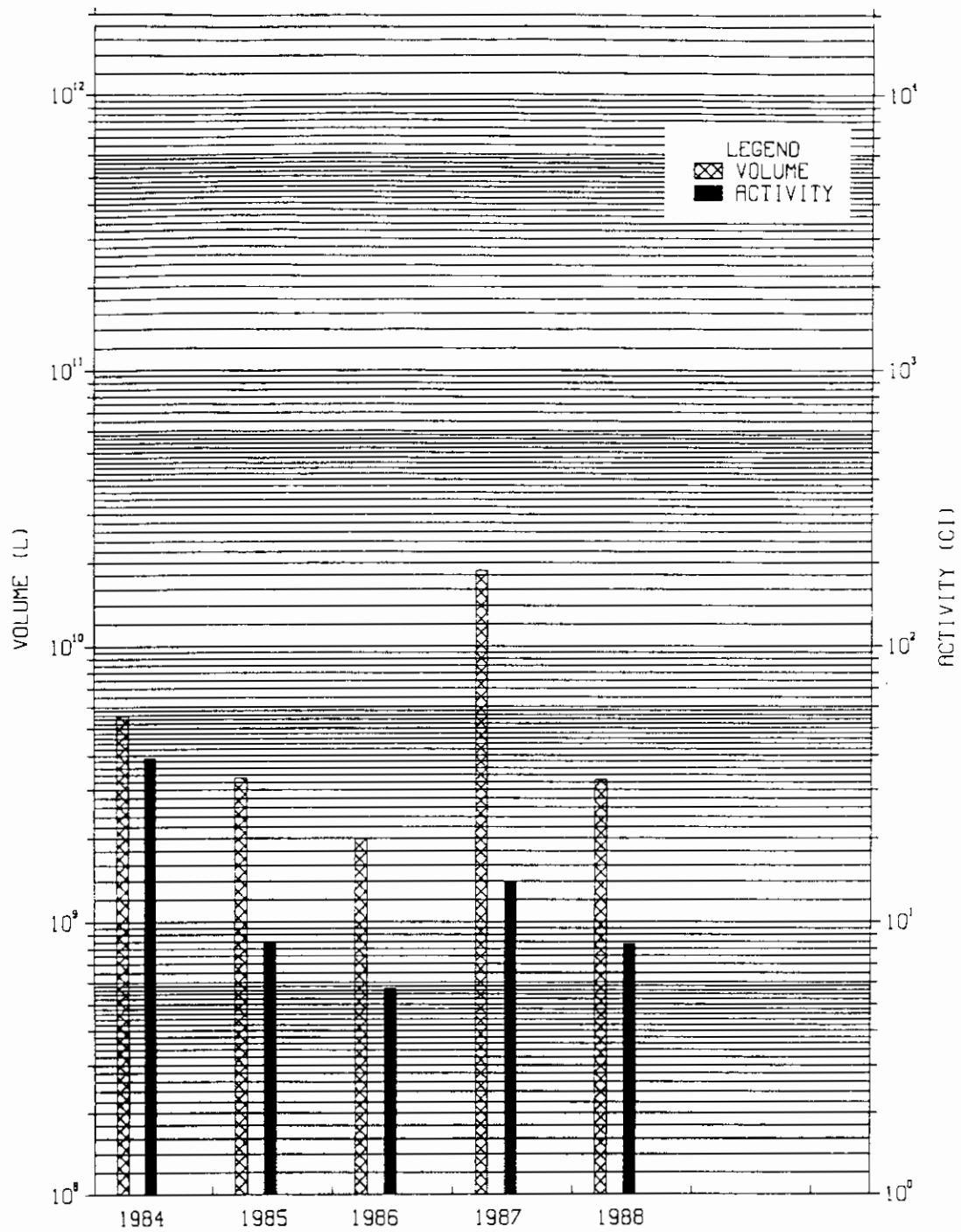


FIG. 14 TOTAL LIQUID EFFLUENT RELEASED FROM CHICAGO OPERATIONS.

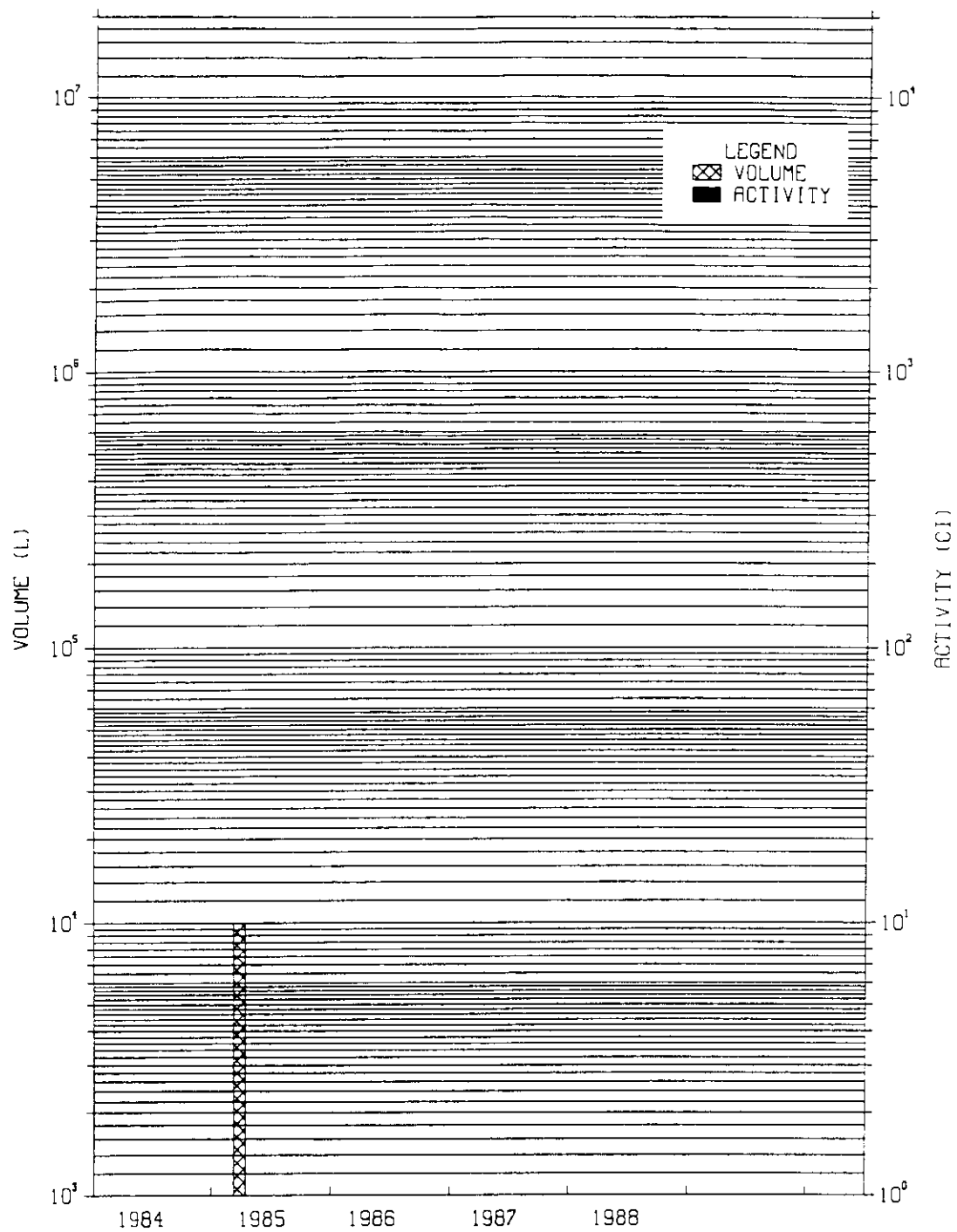


FIG. 15 TOTAL LIQUID EFFLUENT RELEASED FROM NEVADA OPERATIONS.

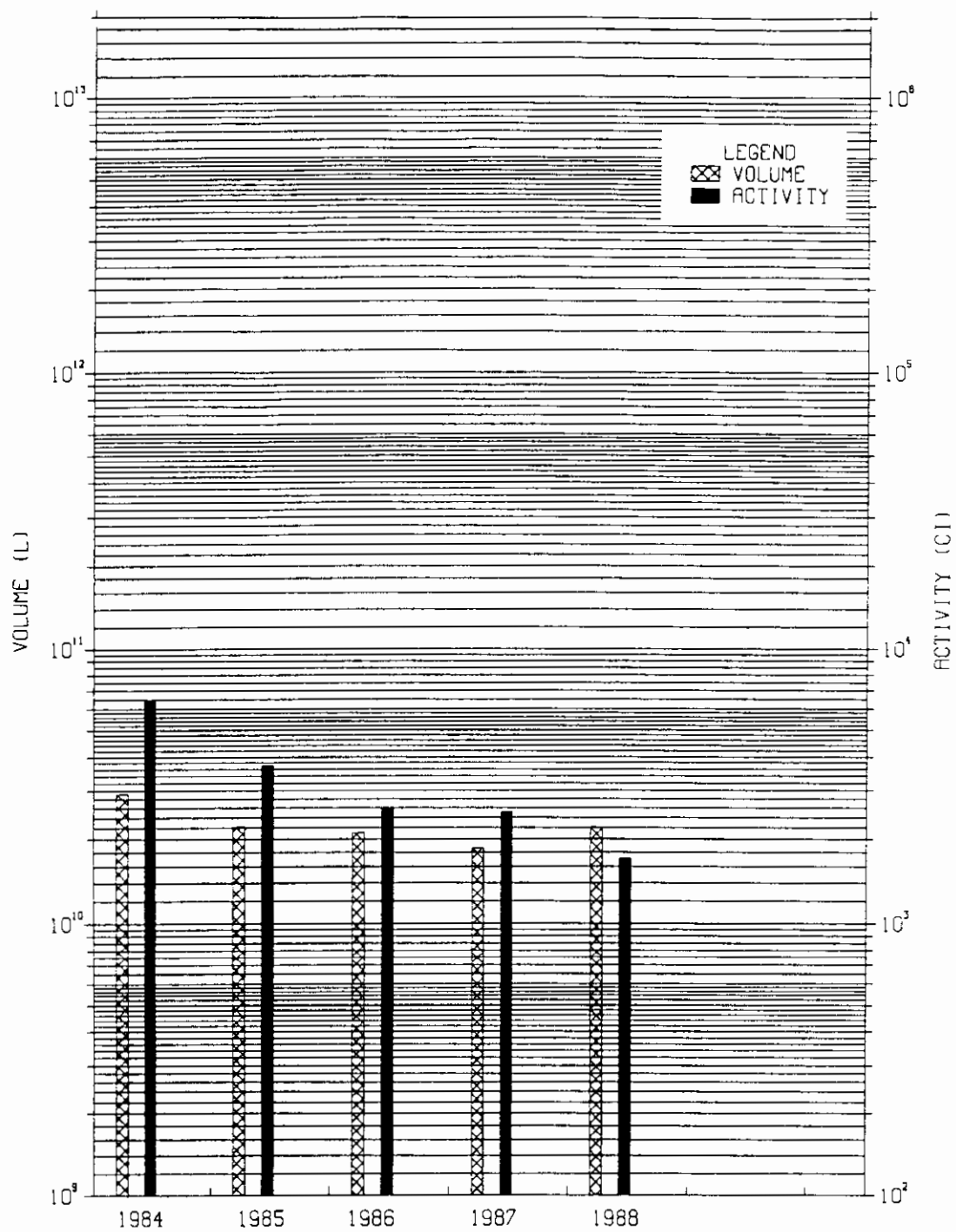


FIG. 16 TOTAL LIQUID EFFLUENT RELEASED FROM OAK RIDGE OPERATIONS.

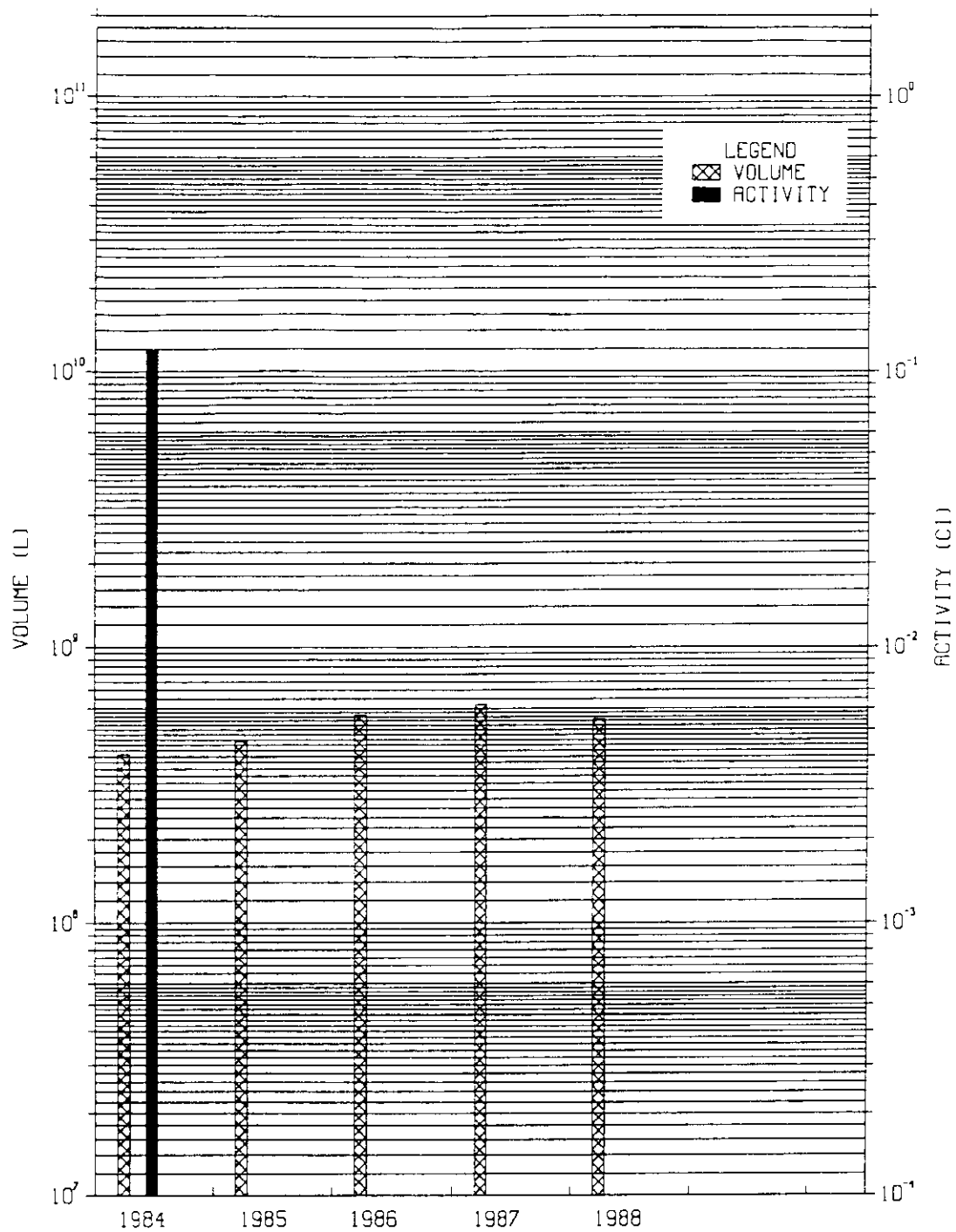


FIG. 17 TOTAL LIQUID EFFLUENT RELEASED FROM PITT. N. R. OPERATIONS.

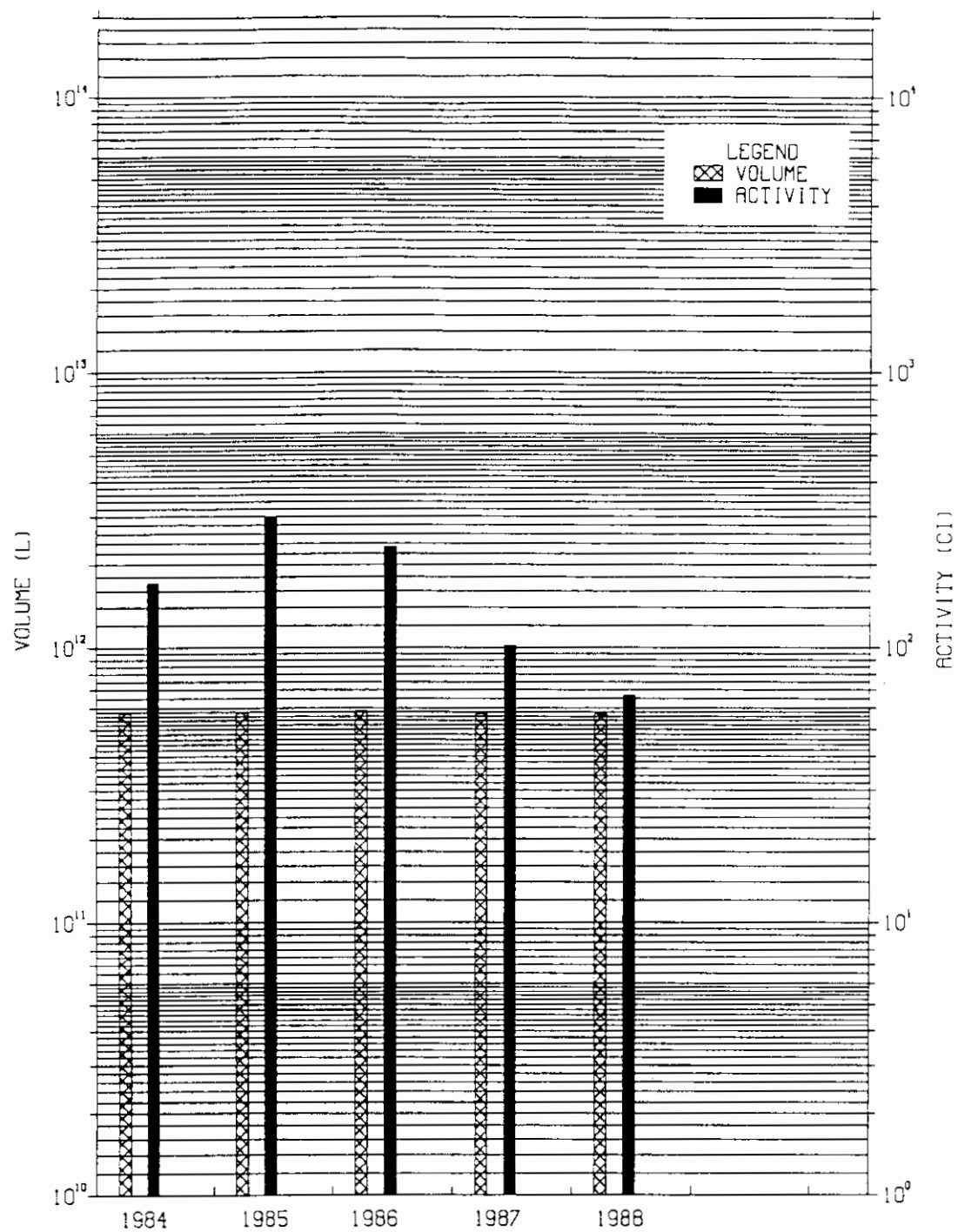


FIG. 18 TOTAL LIQUID EFFLUENT RELEASED FROM RICHLAND OPERATIONS.

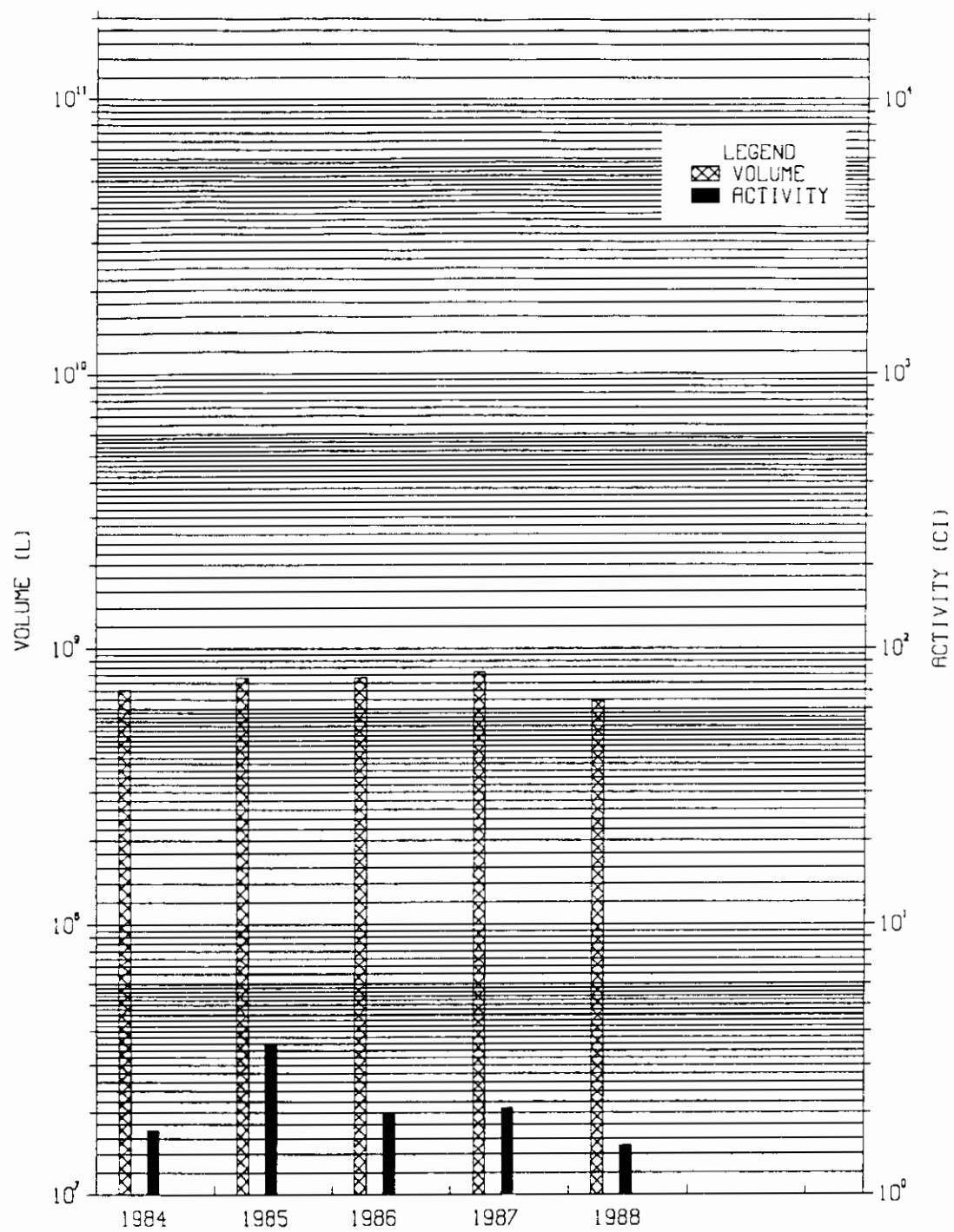


FIG. 19 TOTAL LIQUID EFFLUENT RELEASED FROM SAN FRANCISCO OPERATIONS.

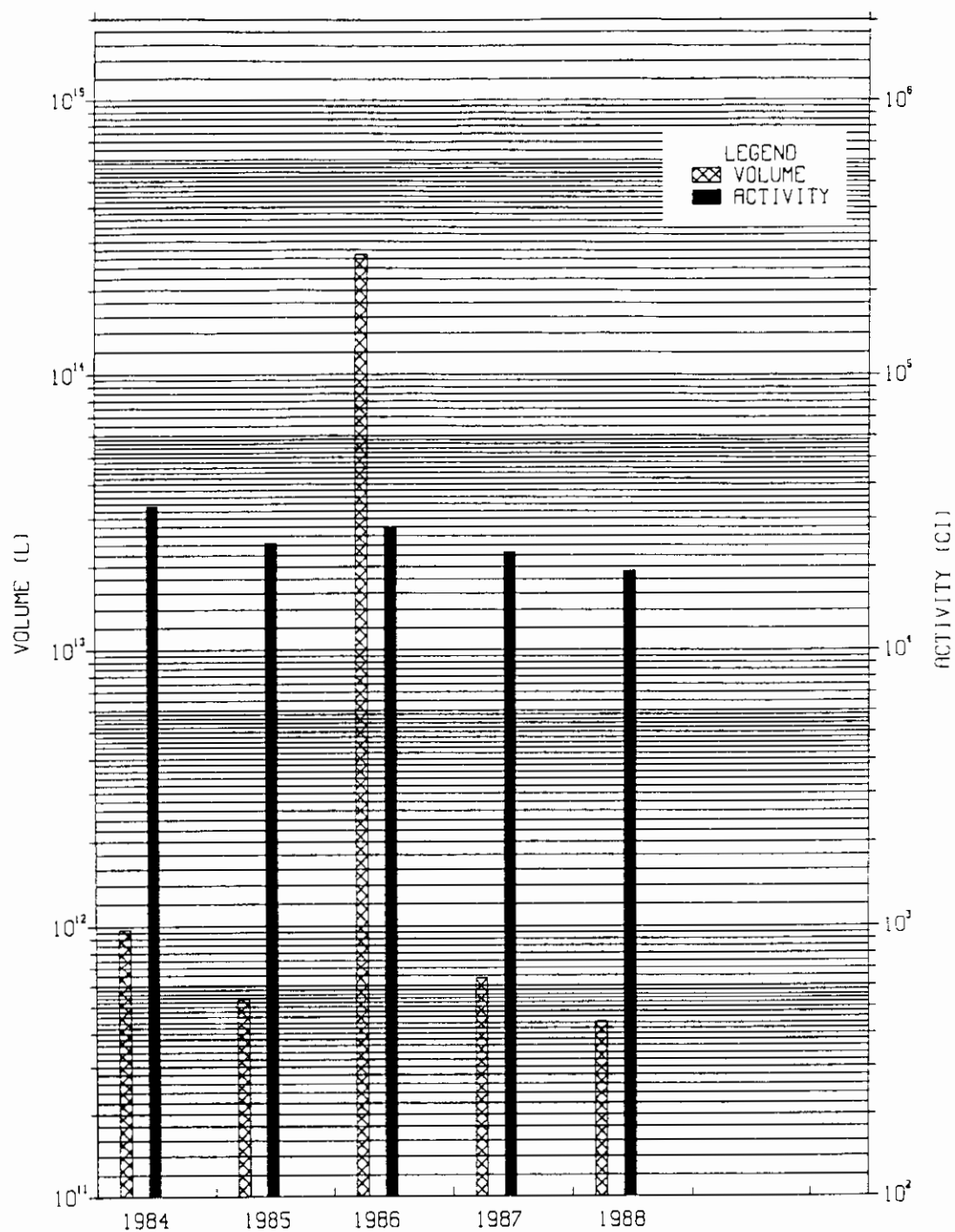


FIG. 20 TOTAL LIQUID EFFLUENT RELEASED FROM SAVANNAH R. OPERATIONS.

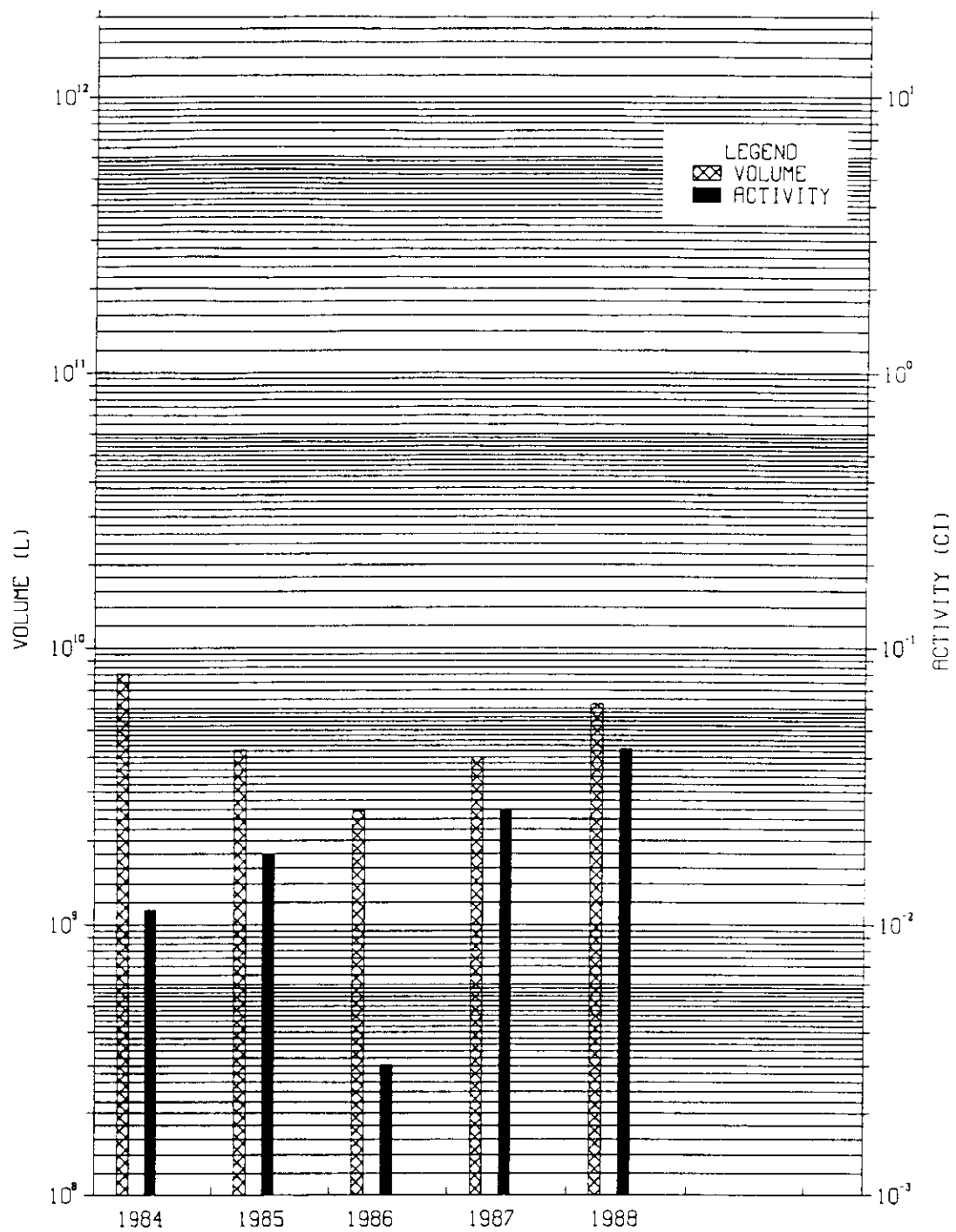


FIG. 21 TOTAL LIQUID EFFLUENT RELEASED FROM SCHEN. N. R. OPERATIONS.

EFFLUENT INFORMATION SYSTEM (EIS)
TOTAL RADIOACTIVITY RELEASED

Figure 22 illustrates and Table IV lists each plant that released greater than 1 Ci of radioactivity to the environment in 1988. There are seven plants whose combined releases account for over 99% of the total DOE radioactivity released for 1988. These plants are:

Los Alamos National Laboratory (Albuquerque)	10.03%
Mound Laboratory (Miamisburg)	0.24%
Lawrence Livermore National Laboratory	0.30%
Idaho Chemical Processing Plant (INEL)	12.93%
Oak Ridge National Laboratory	2.98%
200 East Area (Richland)	14.90%
Savannah River Plant	57.67%

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING ACTIVITY > 1.0 CI

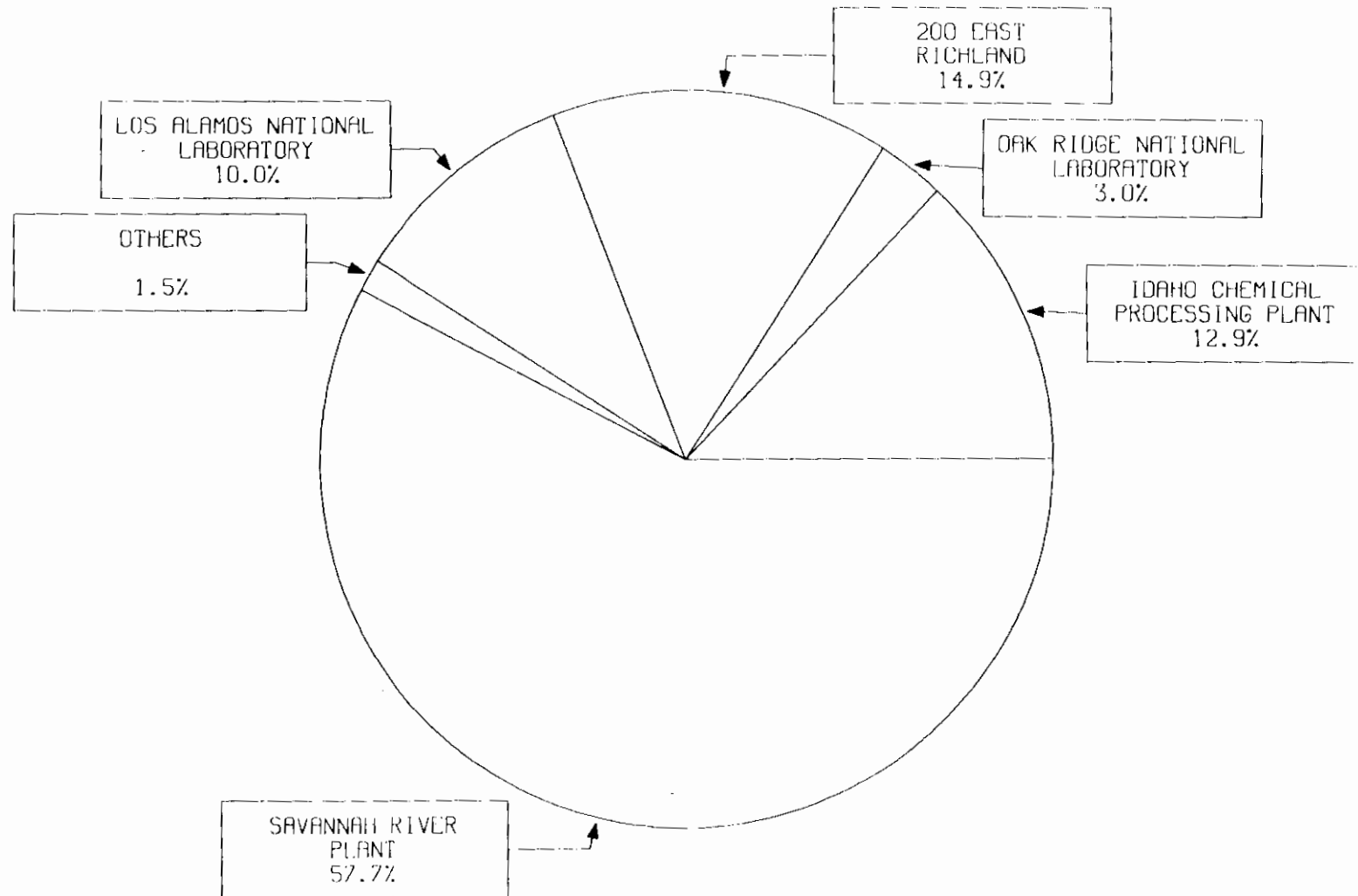


FIGURE 22

TABLE 1V

ALL PLANTS WITH RELEASES GREATER THAN 1 Ci - EIS
(CY 1988)

<u>Operations Office</u>	<u>Plant Title</u>	<u>Airborne (Ci)</u>	<u>Liquid (Ci)</u>	<u>Total (Ci)</u>	<u>CY 1988 Percent of Total DOE Releases</u>
AL	Sandia Laboratories - Albuquerque	1		1	<0.001
AL	Sandia National Laboratories Livermore	1,590		1,590	0.12
AL	Mound Facility	3,204	4	3,208	0.24
AL	Los Alamos National Laboratory	132,492		132,492	10.03
AL	Pinellas Plant	286		286	0.022
SF	Lawrence Berkeley Laboratory - Hill Area	572		572	0.041
SF	Lawrence Livermore Laboratory - Livermore	4,013	2	4,015	0.304
CH	Argonne National Laboratory	3,927		3,927	0.297
CH	Argonne National Laboratory - West (INEL)	618		618	0.047
CH	Brookhaven National Laboratory	2,576	8	2,584	0.196
CH	Fermilab (NAL)	108		108	0.008
ID	Test Reactor Area - INEL	2,608		2,608	0.198
ID	Idaho Chemical Processing Plant - INEL	170,713		170,713	12.93
NV	Lawrence Livermore National Laboratory - NTS	26		26	0.002
NV	Sandia National Laboratory - NTS	68		68	0.005
OR	Oak Ridge National Laboratory	37,668	1,701	39,369	2.98

TABLE IV (cont'd)

<u>Operations Office</u>	<u>Plant Title</u>	<u>Airborne (Ci)</u>	<u>Liquid (Ci)</u>	<u>Total (Ci)</u>	<u>CY 1988 Percent of Total DOE Releases</u>
OR	Feed Materials Production Center (Fernald)		7	7	<0.001
OR	Portsmouth Gaseous Diffusion Plant		1	1	<0.001
PNR	Bettis Atomic Power Laboratory	<1		<1	
RL	N Reactor Plant		66	66	0.005
RL	200 East Area - Richland	196,682		196,682	14.90
RL	Hanford Engineering Development Laboratory	37		37	0.003
SR	Savannah River Plant	742,128	19,338	761,466	57.67
YEG	Knolls Atomic Power Laboratory	6		6	<0.001
	All other plants	<u>4</u>	<u>0</u>	<u>4</u>	<0.001
	TOTALS	1,299,320	21,127	1,320,447	

EFFLUENT INFORMATION SYSTEM (EIS)
SELECTED NUCLIDE RELEASES

Figures 23 through 34 illustrate and Table V tabulates CY 1988 releases of preselected radioisotopes. The reported plants are those that released activity greater than a preset level of radioactivity of a selected radionuclide. The radionuclides and significant level of radioactivity were preselected by DOE-Headquarters/OES. In addition to those preselected by OES, ^{14}C and ^{129}I were added, as they were identified by the Low-Level Airborne Waste Programs as being of concern.

Of all plants releasing ^{14}C activity greater than 0.1 Ci per year in 1988: Savannah River Plant released 76.00%, 200 East Area (Richland) released 13.81%, Idaho Chemical Processing Plant (INEL) released 8.11% and Knolls Atomic Power Laboratory 2.1%.

Of all plants releasing ^3H activity greater than 100 Ci per year in 1988: Savannah River Plant released 95.33%, Lawrence Livermore National Laboratory 0.79%, Los Alamos National Laboratory released 2.18%, and Mound Facility released 0.61%.

Of all plants releasing ^{129}I activity greater than 0.01 Ci per year in 1988: Idaho Chemical Processing Plant released 23.33%, Savannah River Plant released 8.82%, and 200 East (Richland) released 67.84%.

Of all plants releasing ^{131}I activity greater than 0.1 Ci per year in 1988: Airborne - No releases exceeded this level, and Liquid - No releases exceeded this level.

Of all plants releasing ^{85}Kr activity greater than 100 Ci per year in 1988: Savannah River Plant released 39.27%, Oak Ridge National Laboratory released 1.03%, 200 East Area (Richland) released 31.99%, and Idaho Chemical Processing Plant released 27.71%.

Of all plants releasing ^{239}Pu activity greater than 0.001 Ci per year in 1988: There were no plants releasing ^{239}Pu activity exceeding .001 Ci in airborne or in liquid.

Of all plants releasing total Pu activity greater than 0.001 Ci per year in 1988: Air - 200 West Area (Richland) released 100.00%, and Liquid - Oak Ridge National Laboratory released 100.00%.

Of all plants releasing ^{90}Sr activity greater than 0.1 Ci per year in 1988: Air - no releases exceeded this level. Liquid - N Reactor Plant (Richland) released 62.27%, Oak Ridge National Laboratory released 30.86%, and Savannah River Plant released 6.87%.

Of all plants releasing uranium in amounts greater than 10 lb per year in 1988: Airborne - Feed Materials Production Center released 100%. Liquid - RMI Company released 2.88%, Feed Materials Production Center released 69.43%, Hanford Engineering Development Laboratory released 0.83%, Paducah Gaseous Diffusion Plant released 2.99%, Oak Ridge Gaseous Diffusion Plant released 18.05%, Portsmouth Gaseous Diffusion Plant released 2.83%, Savannah River Plant released 0.93%, and Battelle Columbus released 2.06%.

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING C-14 ACTIVITY > 0.1 CI

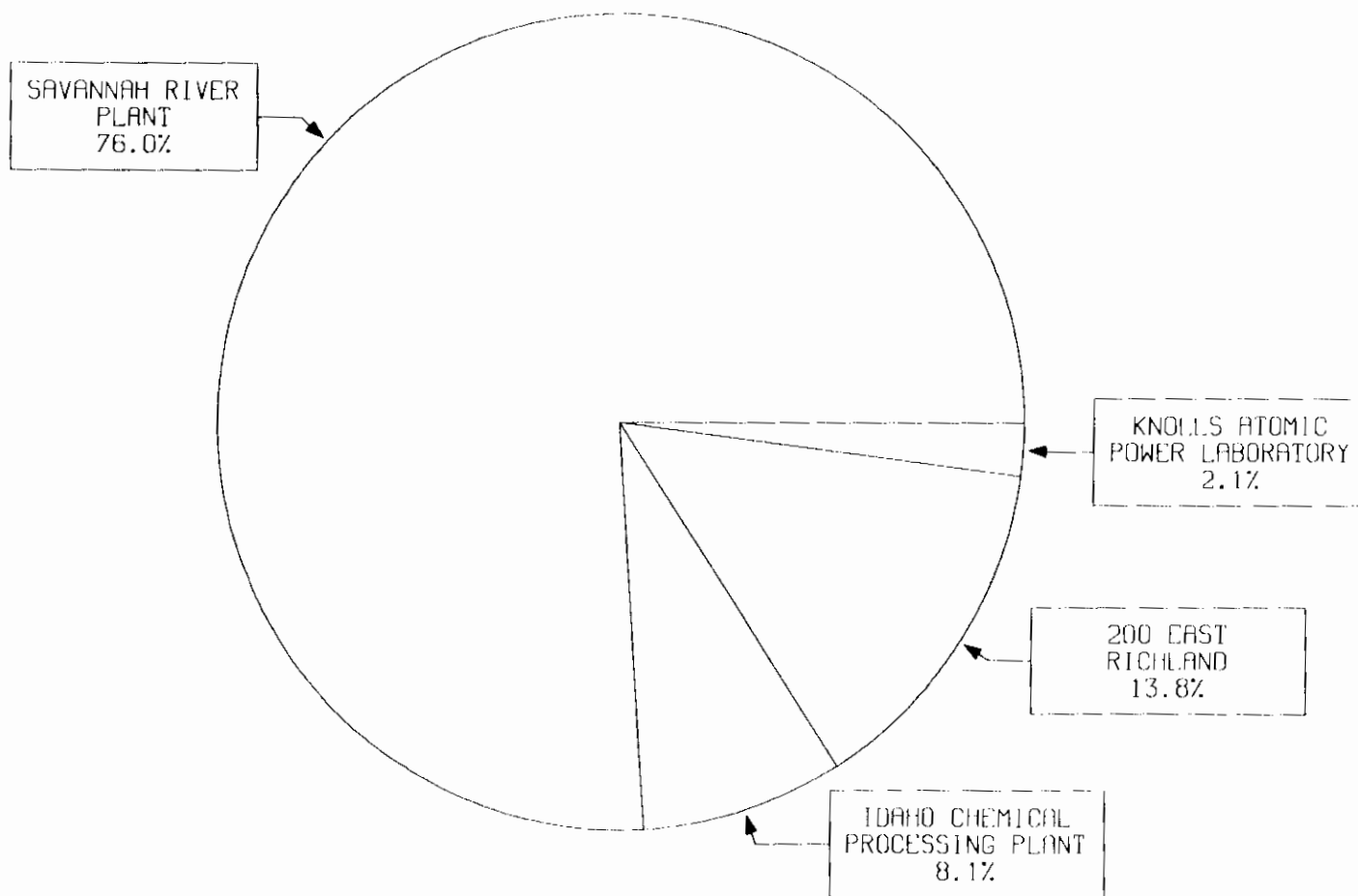


FIGURE 23

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING H-3 ACTIVITY > 100 CI

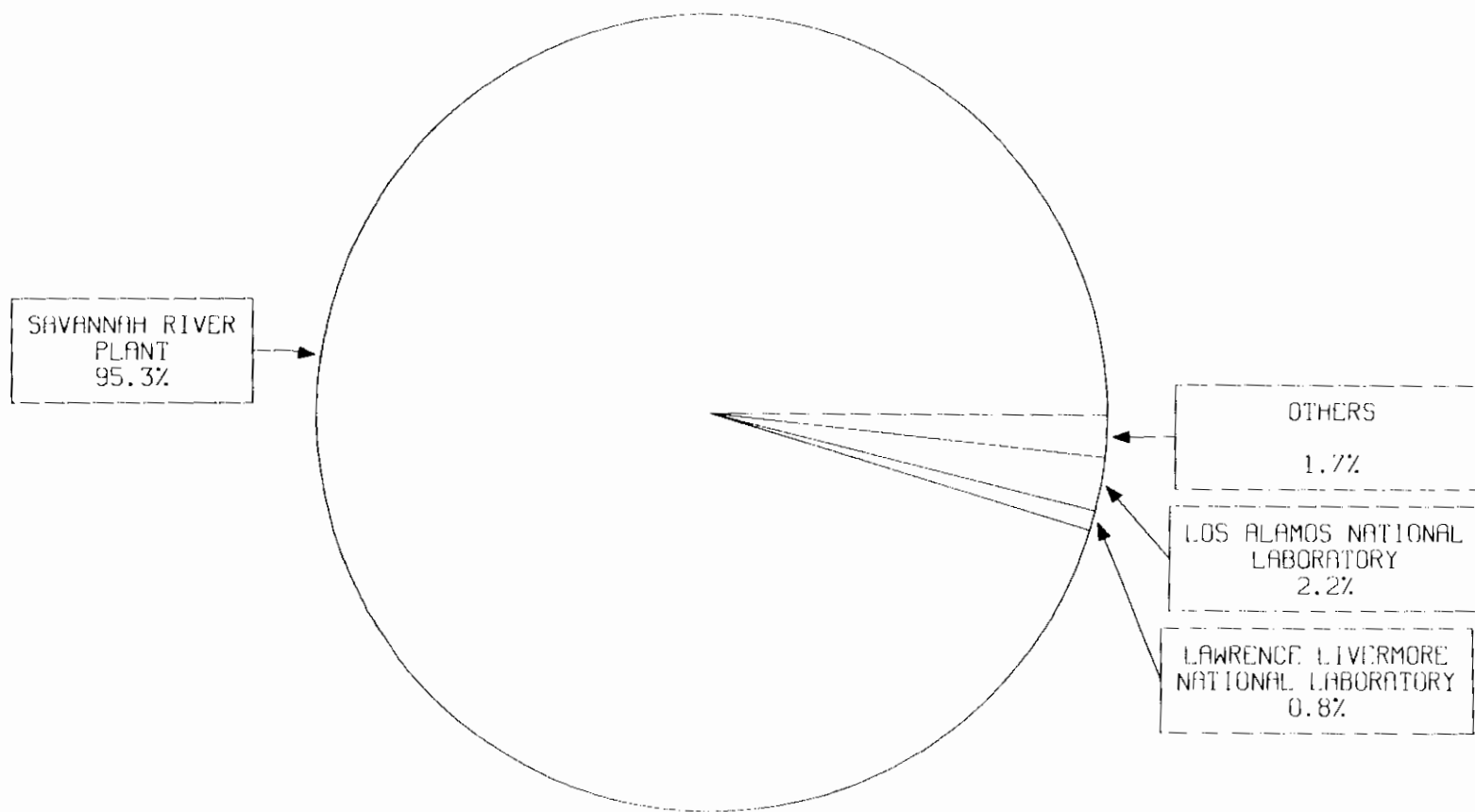


FIGURE 24

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING I-129 ACTIVITY > 0.01 CI

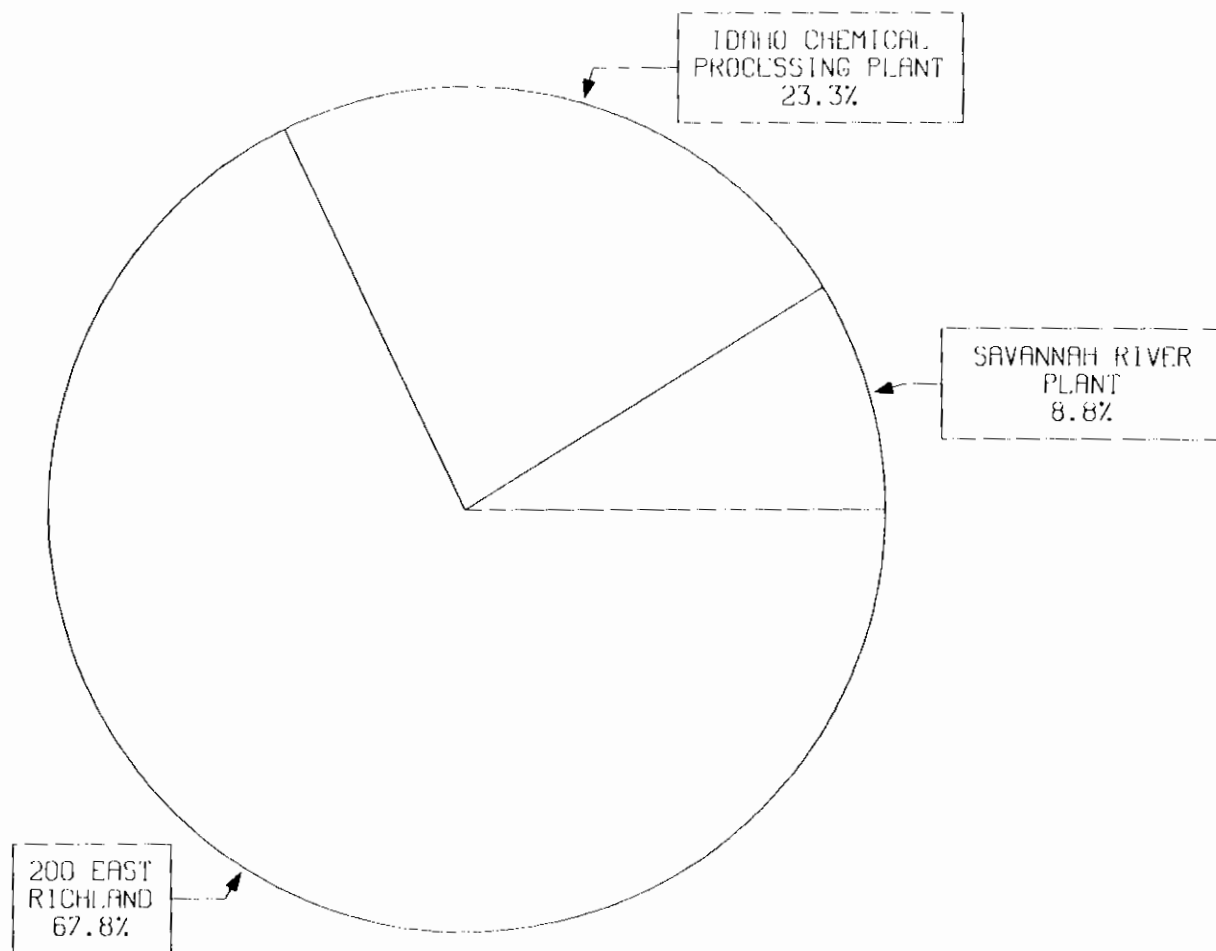


FIGURE 25

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING I 131 AIR ACTIVITY > 0.1 CI

ALL RELEASES BELOW THIS LIMIT IN CY88

FIGURE 26

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING I-131 LIQUID ACTIVITY > 0.1 CI

ALL RELEASES BELOW THIS LIMIT IN CY88

FIGURE 27

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING KR-85 AIR ACTIVITY > 100 CI

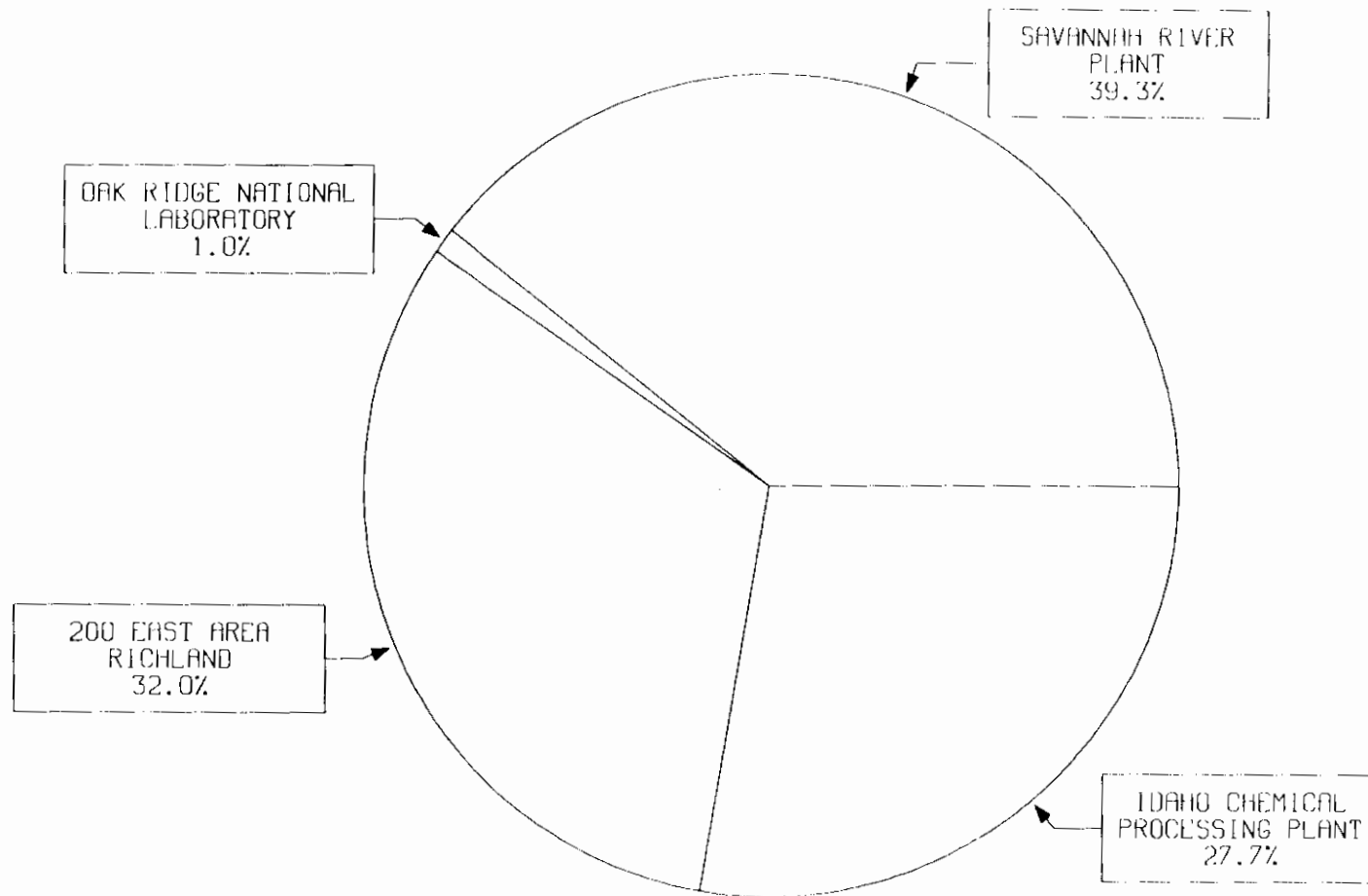


FIGURE 28

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING PU-239 AIR ACTIVITY > 0.001 CI

ALL RELEASES BELOW THIS LIMIT IN CY88

FIGURE 29

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING PU AIR ACTIVITY > 0.001 CI

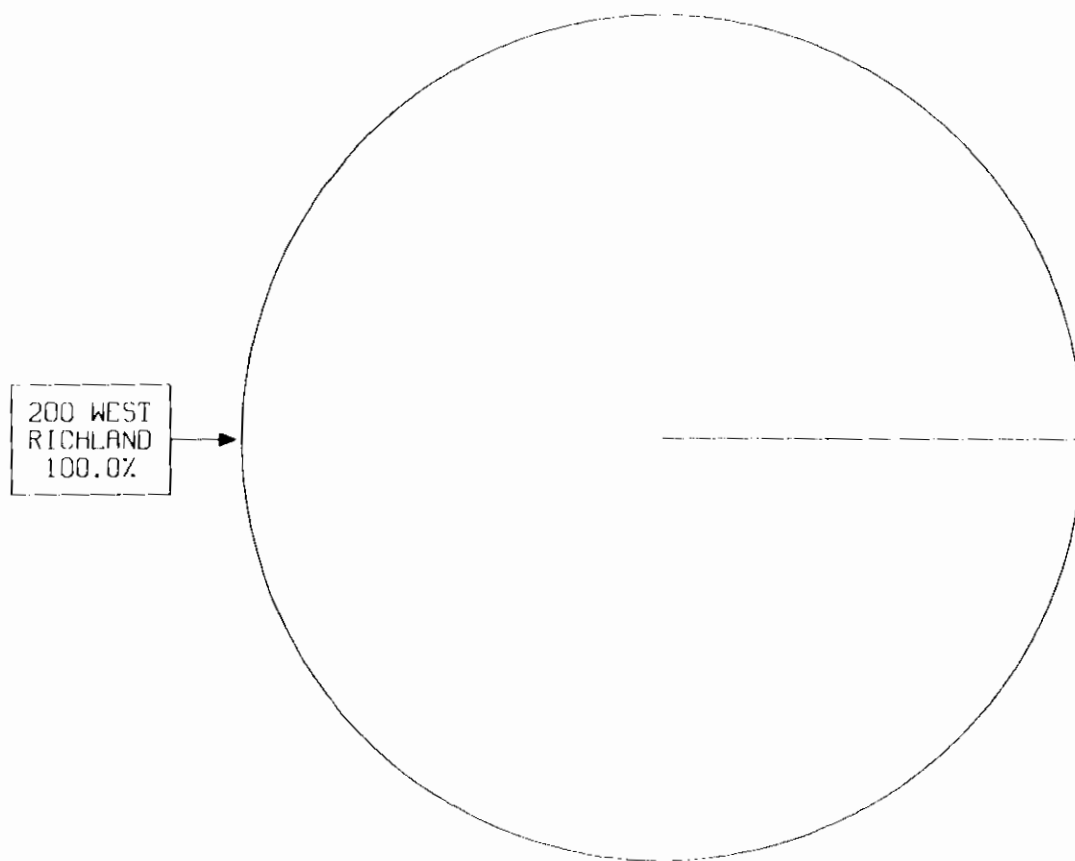


FIGURE 30

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING PU LIQUID ACTIVITY > 0.001 CI

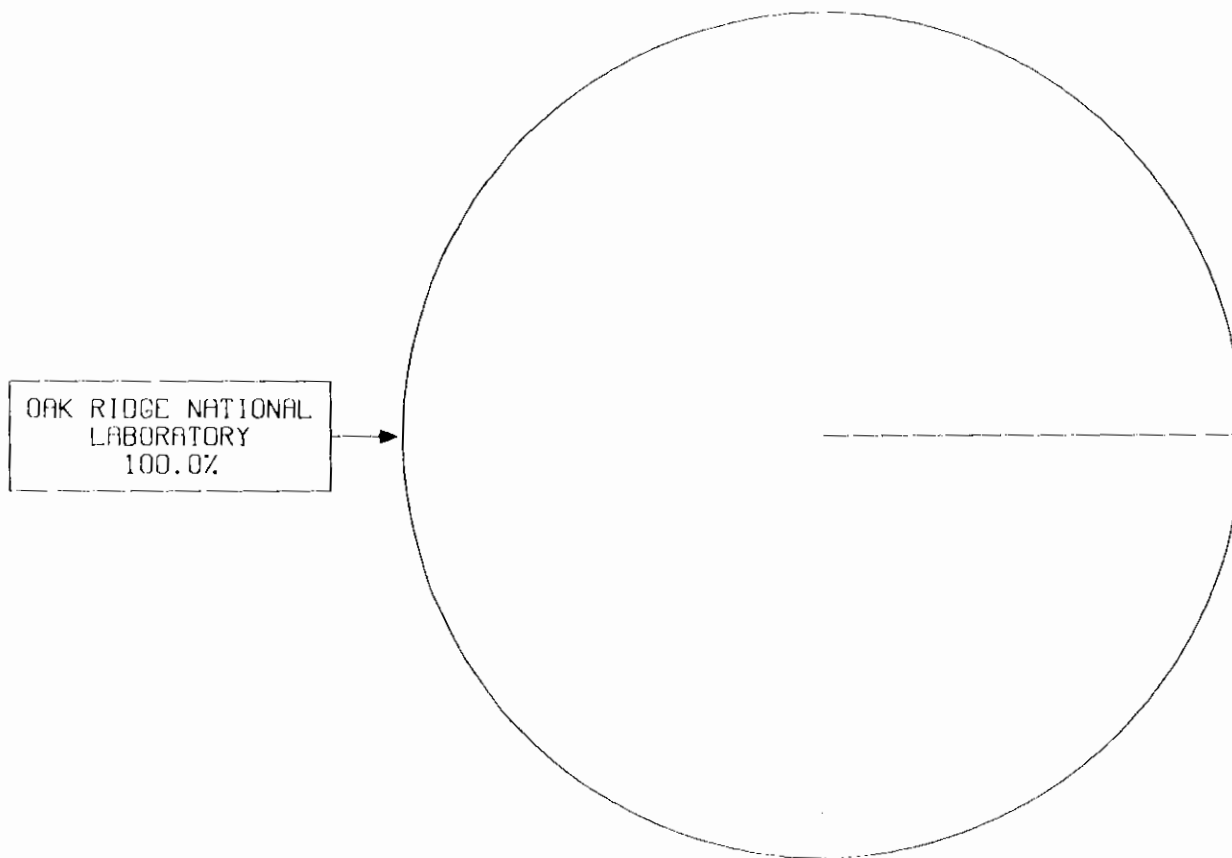


FIGURE 31

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING SR-90 LIQUID ACTIVITY > 0.1 CI

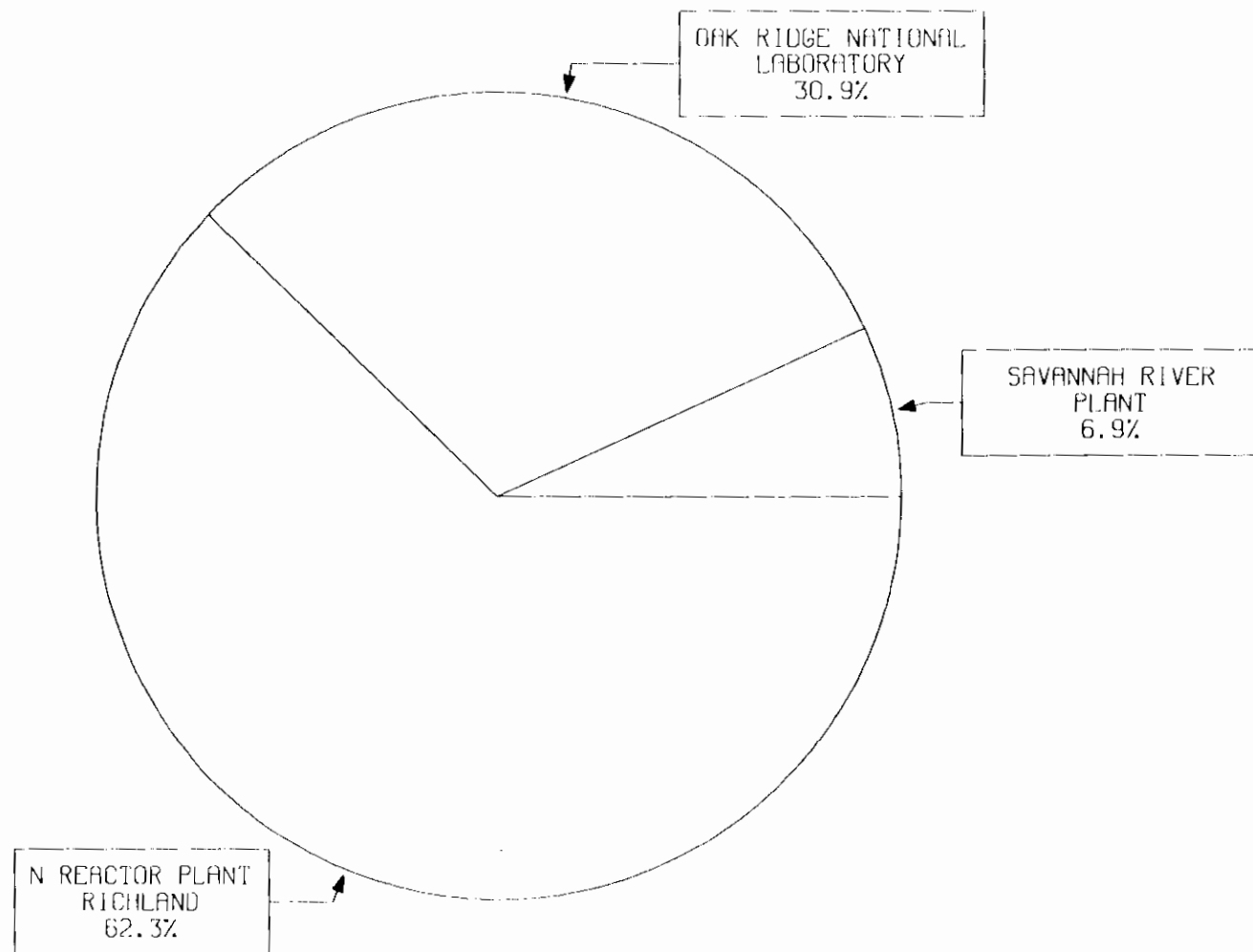


FIGURE 32

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING URANIUM IN AMOUNTS > 10 LB IN AIRBORNE

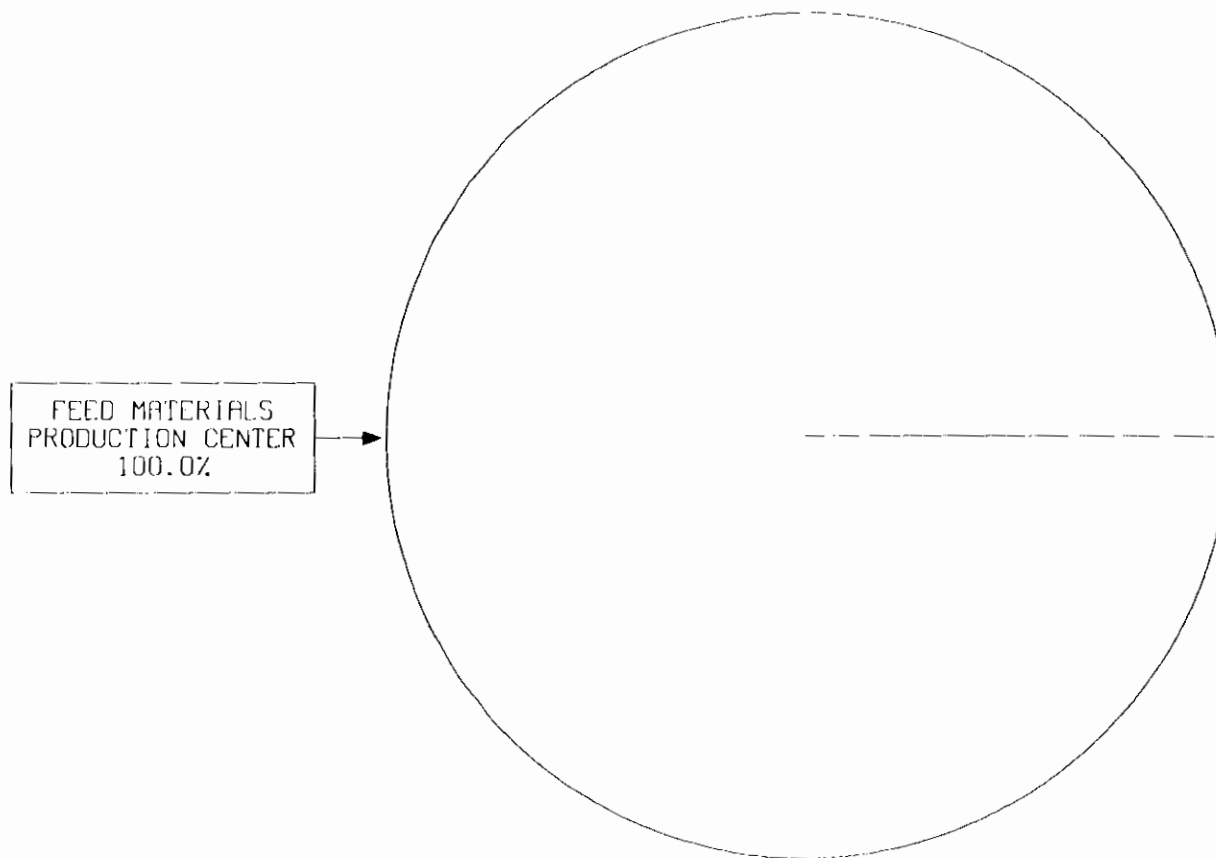


FIGURE 33

PERCENT OF TOTAL DOE RELEASES IN CY88
FOR PLANTS RELEASING URANIUM IN AMOUNTS > 10 LB IN LIQUID

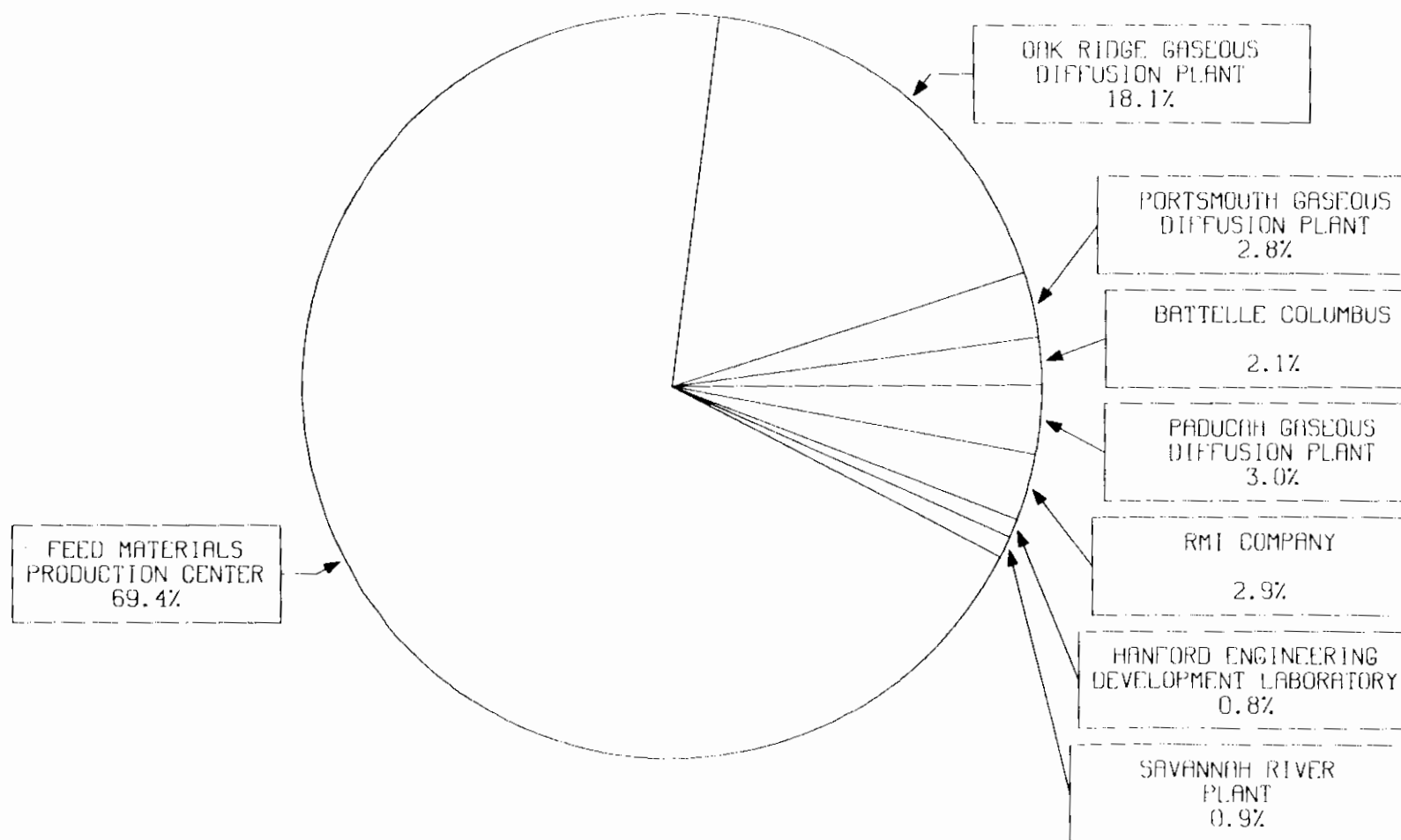


FIGURE 34

TABLE V

ISOTOPIC SUMMARY REPORTS - EIS
(CY 1988)

<u>Operations Office</u>	<u>Plant Title</u>	<u>Airborne (Ci)</u>	<u>Liquid (Ci)</u>	<u>Total (Ci)</u>
<u>Plants with Releases >100 Ci of ^{41}Ar</u>				
AL	Los Alamos National Laboratory	264		264
CH	Brookhaven National Laboratory	1,600		1,600
ID	Test Reactor Area - INEL	2,141		2,141
SR	Savannah River Plant	<u>29,514</u>		<u>29,514</u>
	TOTALS	33,519		33,519
<u>Plants with Releases >0.1 Ci of ^{14}C</u>				
ID	Idaho Chemical Processing Plant	2.56	.	2.56
RL	200 East Area	4.36	.	4.36
YEG	Knolls Atomic Power Plant	0.657		0.657
SR	Savannah River Plant	<u>24.00</u>		<u>24.00</u>
	TOTALS	31.578		31.578
<u>Plants with Releases >0.1 Ci of Halogens</u> (halogens including all iodine nuclides)				
ID	Idaho Chemical Processing Plant	0.1530		0.1530
RL	200 East Area	<u>0.6546</u>		<u>0.6546</u>
	TOTALS	0.8076		0.8076

TABLE V (cont'd)

Operations Office	Plant Title	Airborne (Ci)	Liquid (Ci)	Total (Ci)
<u>Plants with Releases >0.1 Ci of ^{60}Co</u> (includes ^{60}Co and $^{58,60}\text{Co}$)				
RL	N Reactor Plant		<u>0.11</u>	<u>0.11</u>
	TOTALS		0.11	0.11
<u>Plants with Releases >0.1 Ci of ^{137}Cs</u> (includes ^{137}Cs and $^{134,137}\text{Cs}$)				
OR	Oak Ridge National Laboratory		0.390	0.390
RL	N Reactor Plant		0.110	0.110
SR	Savannah River Plant		<u>0.441</u>	<u>0.441</u>
	TOTALS		0.941	0.941
<u>Plants with Releases >100 Ci of ^3H</u>				
AL	Mound Facility	3,087		3,087
AL	Sandia National Laboratories Livermore	1,590		1,590
AL	Los Alamos National Laboratory	10,985		10,985
AL	Lawrence Berkeley Laboratory	540		540
SF	Lawrence Livermore Laboratory-Livermore Site	3,978		3,978
CH	Brookhaven National Laboratory	190		190
ID	Idaho Chemical Processing Plant	703		703

TABLE V (cont'd)

Operations Office	Plant Title	Airborne (Ci)	Liquid (Ci)	Total (Ci)
<u>Plants with Releases >100 Ci of ^3H (cont'd)</u>				
OR	Oak Ridge National Laboratory	350	1,700	2,050
RL	200 East Area	436		436
SR	Savannah River Plant	<u>462,142</u>	<u>19,301</u>	<u>481,442</u>
	TOTALS	484,001	21,001	505,002
<u>Plants with Releases >0.01 Ci of ^{129}I</u>				
ID	Idaho Chemical Processing Plant	0.2250		0.2250
RL	200 East Area	0.6541		0.6541
SR	Savannah River Plant	<u>0.0630</u>	<u>0.0220</u>	<u>0.0850</u>
	TOTALS	0.9421	0.0220	0.9641
<u>Plants with Releases >0.1 Ci of ^{131}I</u>				
None Reported in CY88				
<u>Plants with Releases >100 Ci of ^{85}Kr</u>				
ID	Idaho Chemical Processing Plant	170,000		170,000
OR	Oak Ridge National Laboratory	6,300		6,300
RL	200 East	196,239		196,239
SR	Savannah River Plant	<u>240,931</u>		<u>240,931</u>
	TOTALS	613,470		613,470

TABLE V (cont'd)

Operations Office	Plant Title	Airborne (Ci)	Liquid (Ci)	Total (Ci)
<u>Plants with Releases >0.001 Ci of ^{239}Pu</u>				
None reported in CY88				
<u>Plants with Releases >0.001 Ci of Plutonium</u> (includes all plutonium nuclides)				
OR	Oak Ridge National Laboratory		0.0030	0.0030
RL	200 West Area	<u>0.0018</u>		<u>0.0018</u>
	TOTALS	0.0018	0.0030	0.0048
<u>Plants with Releases >0.1 Ci of ^{90}Sr</u> (includes ^{90}Sr and $^{89,90}\text{Sr}$)				
OR	Oak Ridge National Laboratory		1.100	1.100
RL	N Reactor Plant		2.220	2.220
SR	Savannah River Plant		<u>0.245</u>	<u>0.245</u>
	TOTALS		3.565	3.565
<u>Plants with Releases >10 lb of Uranium</u>				
		(lb)	(lb)	(lb)
CH	Battelle Columbus		77	77
OR	RMI Company		108	108
OR	Oak Ridge Gaseous Diffusion Plant		676	676
OR	Feed Materials Production Center	210	2,601	2,811
OR	Portsmouth Gaseous Diffusion Plant		106	106

TABLE V (cont'd)

Operations Office	Plant Title	Airborne (Ci)	Liquid (Ci)	Total (Ci)
<u>Plants with releases >10 lb of Uranium (cont'd)</u>				
OR	Paducah Gaseous Diffusion Plant		112	112
RL	Hanford Engineering Development Laboratory		31	31
SR	Savannah River Plant		35	35
	TOTALS	210	3,746	3,955

TABLE VI

SUMMARY OF RADIOACTIVE RELEASES - EIS
(CY 1988)

Operations Office	Airborne		Liquid		Totals
	Volume (m ³)	Radioactivity (Ci)	Volume (L)	Radioactivity (Ci)	Radioactivity (Ci)
Albuquerque Operations Office	4.964E+10	1.376E+05	1.169E+09	4.632E+00	1.376E+05
San Francisco Operations Office	2.051E+09	4.585E+03	6.401E+08	1.509E+00	4.587E+03
Chicago Operations Office	2.638E+09	7.230E+03	3.261E+09	8.356E+00	7.238E+03
Idaho Operations Office	5.820E+09	1.733E+05			1.733E+05
Nevada Operations Office	3.228E+08	9.408E+01			9.408E+01
Oak Ridge Operations Office	4.254E+09	3.767E+04	2.211E+10	1.711E+03	3.938E+04
Pittsburgh Naval Reactors Operations Office	2.632E+09	1.064E+00	5.478E+08	0.000E+00	1.064E+00
Richland Operations Office	3.063E+10	1.967E+05	5.713E+11	6.672E+01	1.968E+05
Savannah River Operations Office	4.579E+10	7.421E+05	4.446E+11	1.934E+04	7.615E+05
Schenectady Naval Reactors Operations Office	<u>2.777E+09</u>	<u>6.445E+00</u>	<u>6.238E+09</u>	<u>4.287E-02</u>	<u>6.487E+00</u>
DOE TOTALS	1.466E+11	1.299E+06	1.050E+12	2.113E+04	1.320E+06

ONSITE DISCHARGE INFORMATION SYSTEM

This section summarizes the Onsite Discharge Information System (ODIS) reports for CY 1988. Only the liquid discharge is discussed, as there were no routine airborne discharges reported in ODIS in 1988.

Table VII is a summary of the combined total radioactivity discharged onsite by each Operations Office and its contractors for the years 1984 - 1988. These data are also presented graphically in Figures 35 through 43. The details on the individual contributions of the major facilities to the total DOE radioactivity discharged are presented in Table VIII.

Table VIII lists all DOE discharge points that discharged greater than 1 Ci of radioactivity in 1988. Of the 65 discharge points currently active, only seventeen discharged radioactivity in amounts greater than 1 Ci. Of these seventeen, eight discharge points account for 98.22% of the total radioactivity discharged by DOE facilities in 1988. They are: E Tunnel (NTS), White Oak Lake (Oak Ridge), Purex Facility (Richland), Tank Farm Facility (Richland), F & H Separations (Savannah River), and K-, L- and P Reactor Plants (Savannah River).

Table IX identifies discharges of preselected radioisotopes reported in the CY 1988 discharges. These data are grouped into subtables according to nuclide and the facilities that discharged a significant quantity of that nuclide. The nuclides reported in Table IX and the significant reporting quantities were preselected by DOE-Headquarters Operational and Environmental Safety Division (OES). Information of this type for other nuclides may be obtained from the ODIS data file upon request.

Table X lists the total volume and radioactivity discharged during 1988 at each Operations Office. The DOE total for liquid discharge volume was 3.770×10^{11} L containing 2.314×10^4 Ci of radioactivity.

Table XI lists the active storage/disposal facilities (SDF) and their cumulative inventories of ^3H and ^{239}Pu corrected for decay. The term "SDF", as used here, applies only to radioactive liquid effluent storage or disposal facilities -- not all waste facilities. The two nuclides ^3H and ^{239}Pu were selected and reported in this table as they are of special concern to the public. Information of this type for other nuclides and for inactive SDF's may be obtained from the ODIS data file upon request.

ONSITE DISCHARGE INFORMATION SYSTEM (ODIS)
LIQUID DISCHARGE RADIOACTIVITY CHANGES

Albuquerque Operations

The Albuquerque Operations liquid radioactivity discharged onsite in 1988 shows a decrease compared to 1987. Most of this decrease is due to better management of the radioactivity discharged by the source at Los Alamos National Laboratory (LANL).

Chicago Operations

The Chicago Operations liquid radioactivity discharged onsite in 1988 shows no significant decrease (within expected variation) compared to 1987.

Idaho Operations

The Idaho Operations liquid radioactivity discharged onsite in 1988 shows a decrease compared to 1987. Most of the decrease is the result of reduction in radioactivity discharged by the Idaho Chemical Processing Plant (ICPP).

Nevada Operations

The Nevada Operations liquid radioactivity discharged onsite in 1988 shows a decrease compared to 1987. This decrease is due to decreased discharge of radioactivity from the T-Tunnel.

Oak Ridge Operations

The Oak Ridge Operation liquid radioactivity discharged onsite in 1988 shows a decrease compared to 1987. The decrease is due to the drought which lowered the flow in the tributary streams that feed White Oak Lake in 1988.

Pittsburgh Naval Reactors

The Pittsburgh Naval Reactors discharged no liquid radioactivity onsite for 1984, 1985, 1986, 1987 and 1988.

Richland Operations

The Richland Operations liquid radioactivity discharged onsite in 1988 shows an increase compared to 1987. The increase is the result of increase in Purex operations in 1988.

Savannah River Operations

The Savannah River Operations liquid radioactivity discharged onsite in 1988 shows a decrease compared to 1987. This decrease is the result of reduction in the separation operations.

TABLE VII

FIVE-YEAR SUMMARY OF ANNUAL RADIOACTIVITY DISCHARGED TO ONSITE STORAGE/DISPOSAL FACILITIES IN CURIES - ODIS
(CY 1984-1988)

<u>Year</u>	<u>Operations Office</u>								<u>DOE TOTAL</u>
	<u>AL</u>	<u>CH</u>	<u>ID</u>	<u>NV</u>	<u>OR</u>	<u>PNR</u>	<u>RL</u>	<u>SR</u>	
1984	56	1	191	3,086	56,536	-	23,257	34,606	117,733
1985	76	1	784	1,873	2	-	20,446	38,746	62,929
1986	91	1	345	11,124	1	-	18,050	51,737	81,344
1987	112	2	360	8,919	1,100	-	2,780	34,046	47,320
1988	26	1	269	4,795	1,071	-	3,285	13,750	23,137

NOTE: Details may not add up to totals due to rounding.

ON-SITE DISCHARGE INFORMATION SYSTEM (ODIS)
LIQUID GRAPHICS

An explanation of significant changes in data reported graphically follow:

The liquid discharge graph for the Albuquerque Operations Office (Figure 36) shows a decrease in the amount of liquid radioactivity discharged onsite in 1988 compared to 1987. This decrease is due to better management of the liquid discharge at sources at Los Alamos National Laboratory resulting in lessened quantity of radioactivity discharged.

The liquid discharge graph for the Idaho Operations Office (Figure 38) shows a (net) decrease in the amount of liquid radioactivity discharged onsite in 1988 compared to 1987. There was a decrease in radioactivity discharged by the Idaho Chemical Processing Plant (ICPP) and an increase in radioactivity discharged by the Advanced Test Reactor (ATR). The decrease reported by ICPP is the result of reduction in processing.

The liquid discharge graph for the Nevada Operations Office (Figure 39) shows a decrease in amount of liquid radioactivity discharged onsite in 1988 compared to 1987. The decrease is attributable to the reduced liquid radioactivity discharge from the T-Tunnel.

The liquid discharge graph for the Oak Ridge Operations Office (Figure 40) shows no change in radioactivity discharged but a significant drop in the volume discharged. This decrease in volume is attributable to the drought in that region the reduced the flow in the discharge streams.

The liquid discharge graph for the Richland Operations Office (Figure 41) shows an increase in the amount of liquid radioactivity discharged onsite in 1988 compared to 1987. This increase is attributable to increase in Purex Plant operations in 1988.

The liquid discharge graph for the Savannah River Operations Office (Figure 43) shows a decrease in the amount of liquid radioactivity discharged onsite in 1988 compared to 1987. Much of the decrease is attributable to reduction in processing in 1988.

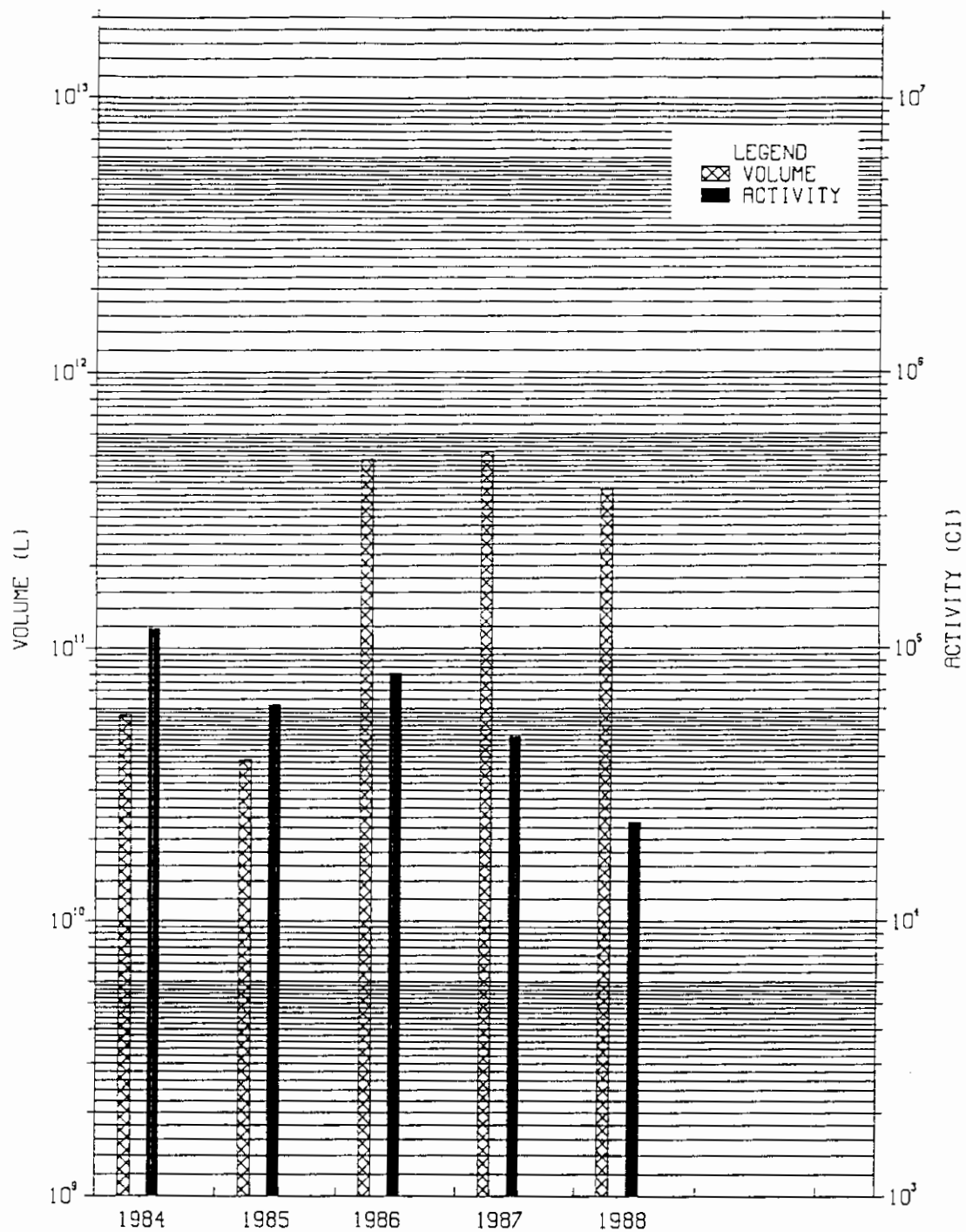


FIG. 35 TOTAL LIQUID EFFLUENT DISCHARGED FROM ALL OOE FACILITIES.

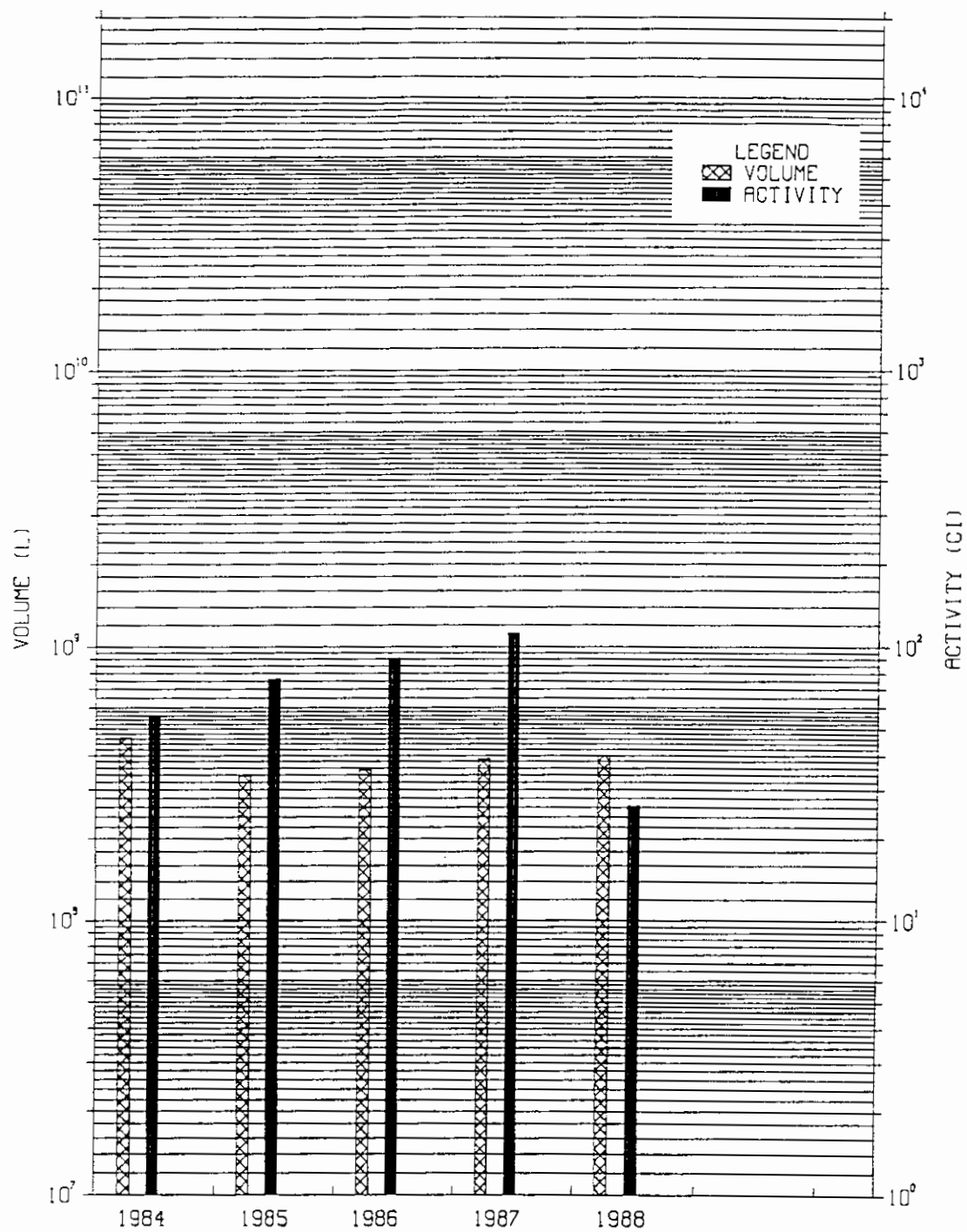


FIG. 36 TOTAL LIQUID EFFLUENT DISCHARGED FROM ALBUQUERQUE OPERATIONS.

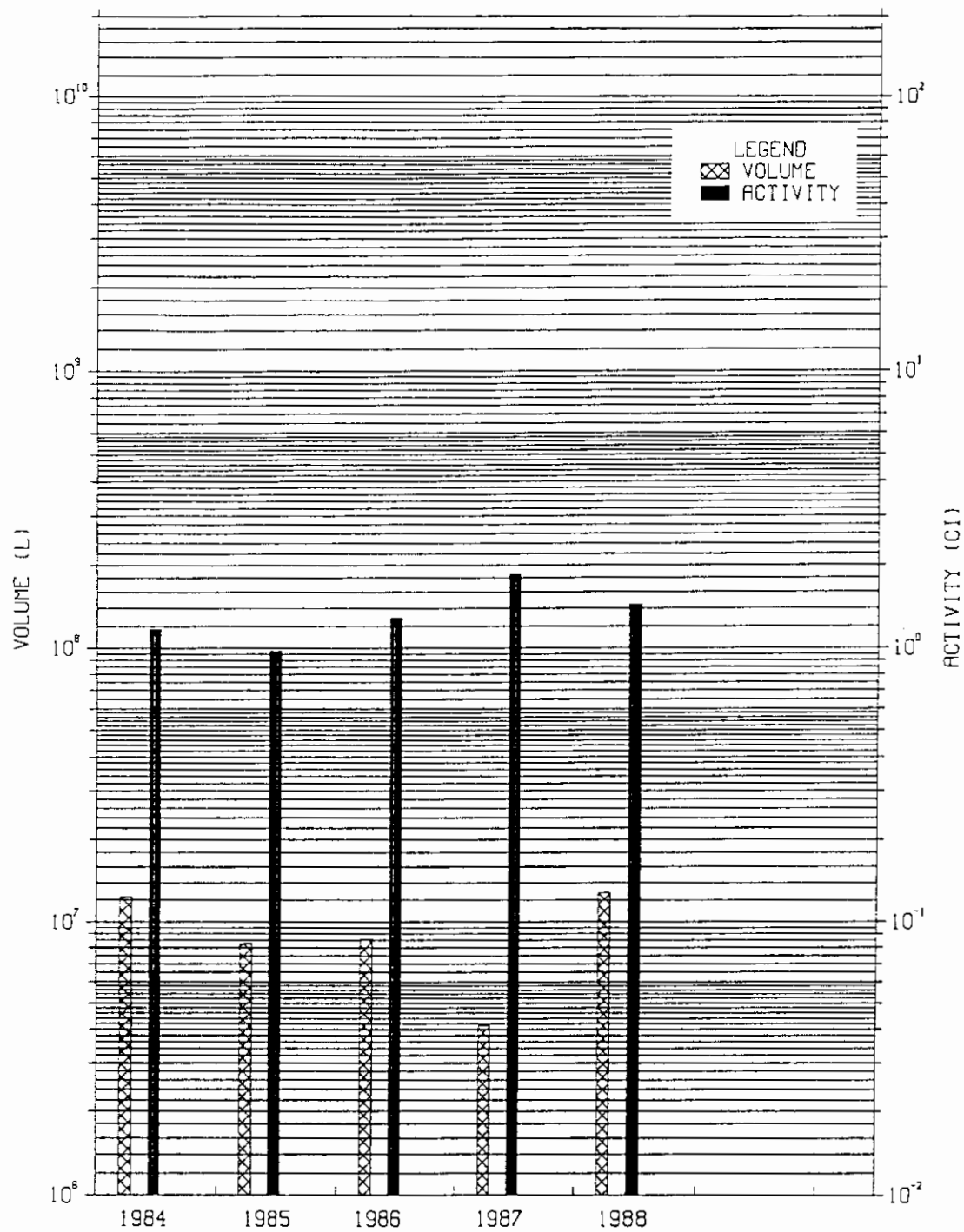


FIG. 37 TOTAL LIQUID EFFLUENT DISCHARGED FROM CHICAGO OPERATIONS.

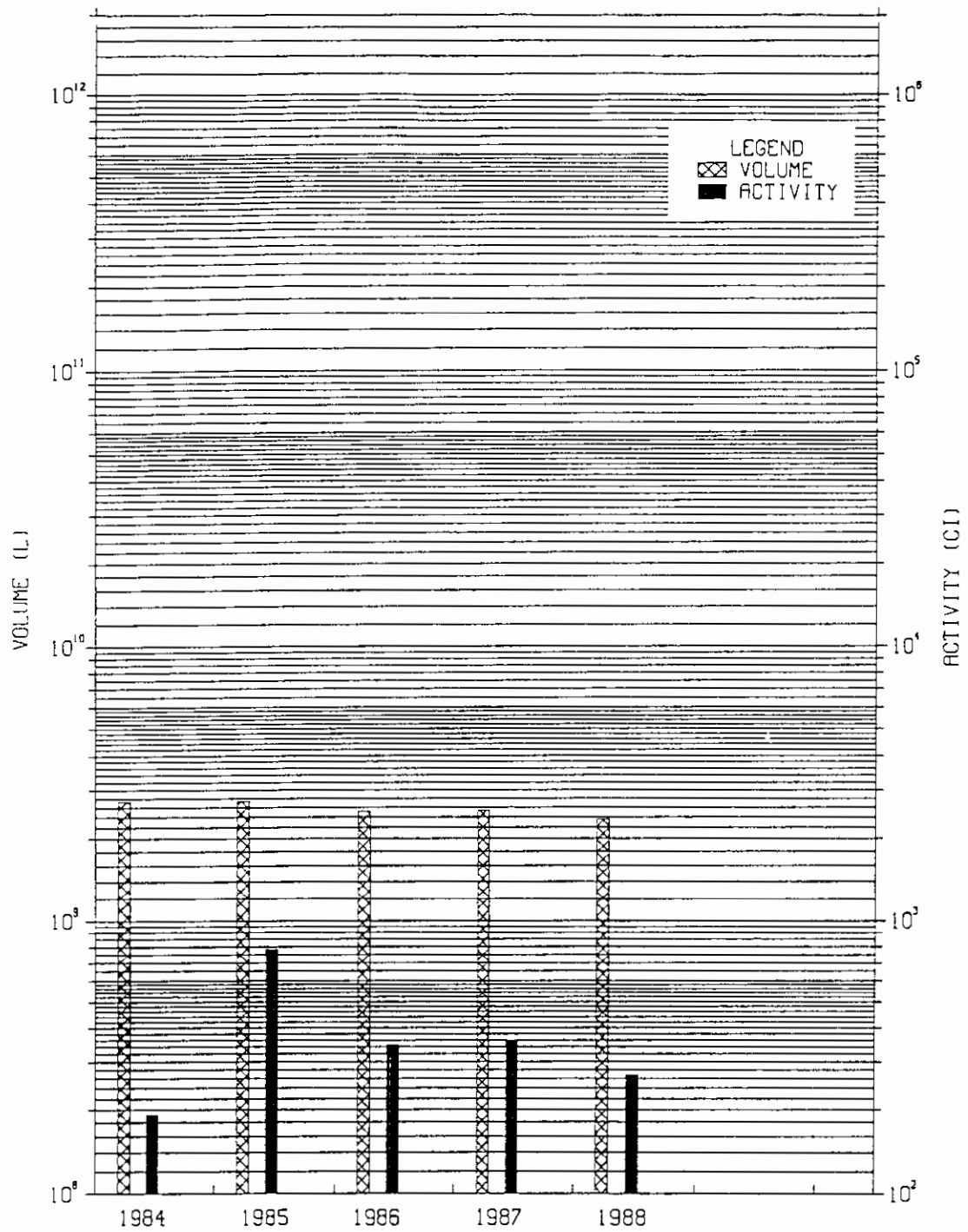


FIG. 38 TOTAL LIQUID EFFLUENT DISCHARGED FROM IDAHO OPERATIONS.

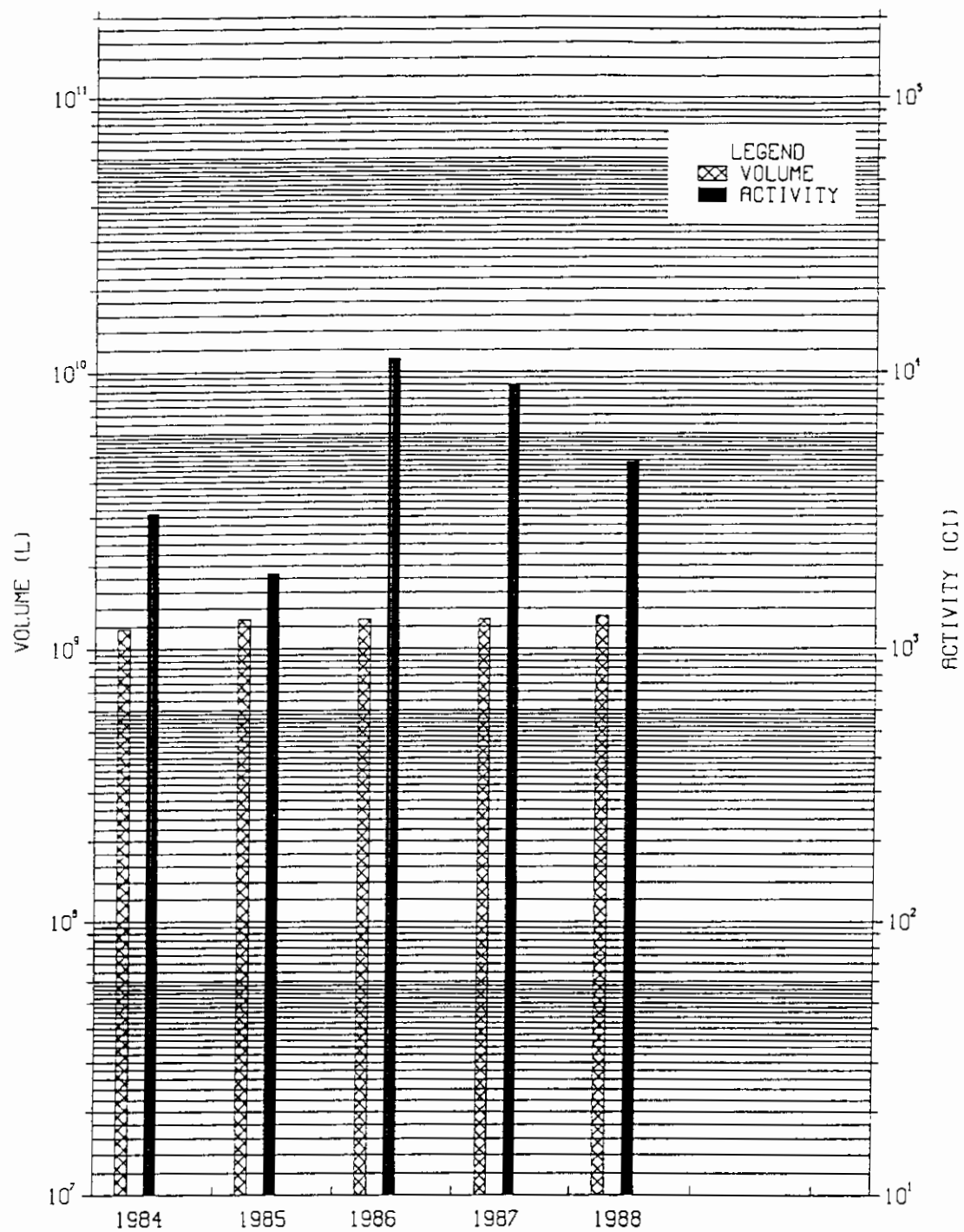


FIG. 39 TOTAL LIQUID EFFLUENT DISCHARGED FROM NEVADA OPERATIONS.

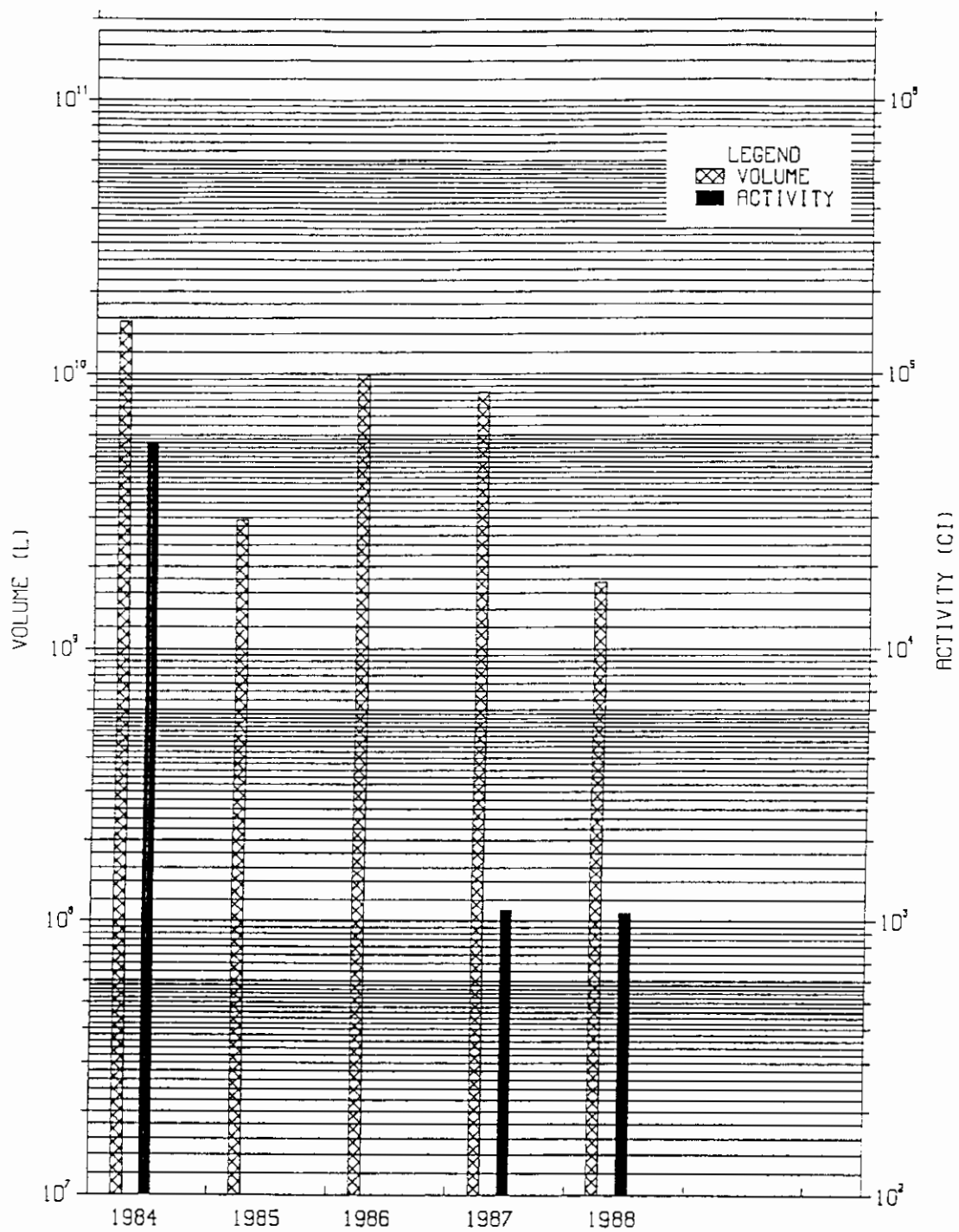


FIG. 40 TOTAL LIQUID EFFLUENT DISCHARGED FROM OAK RIDGE OPERATIONS.

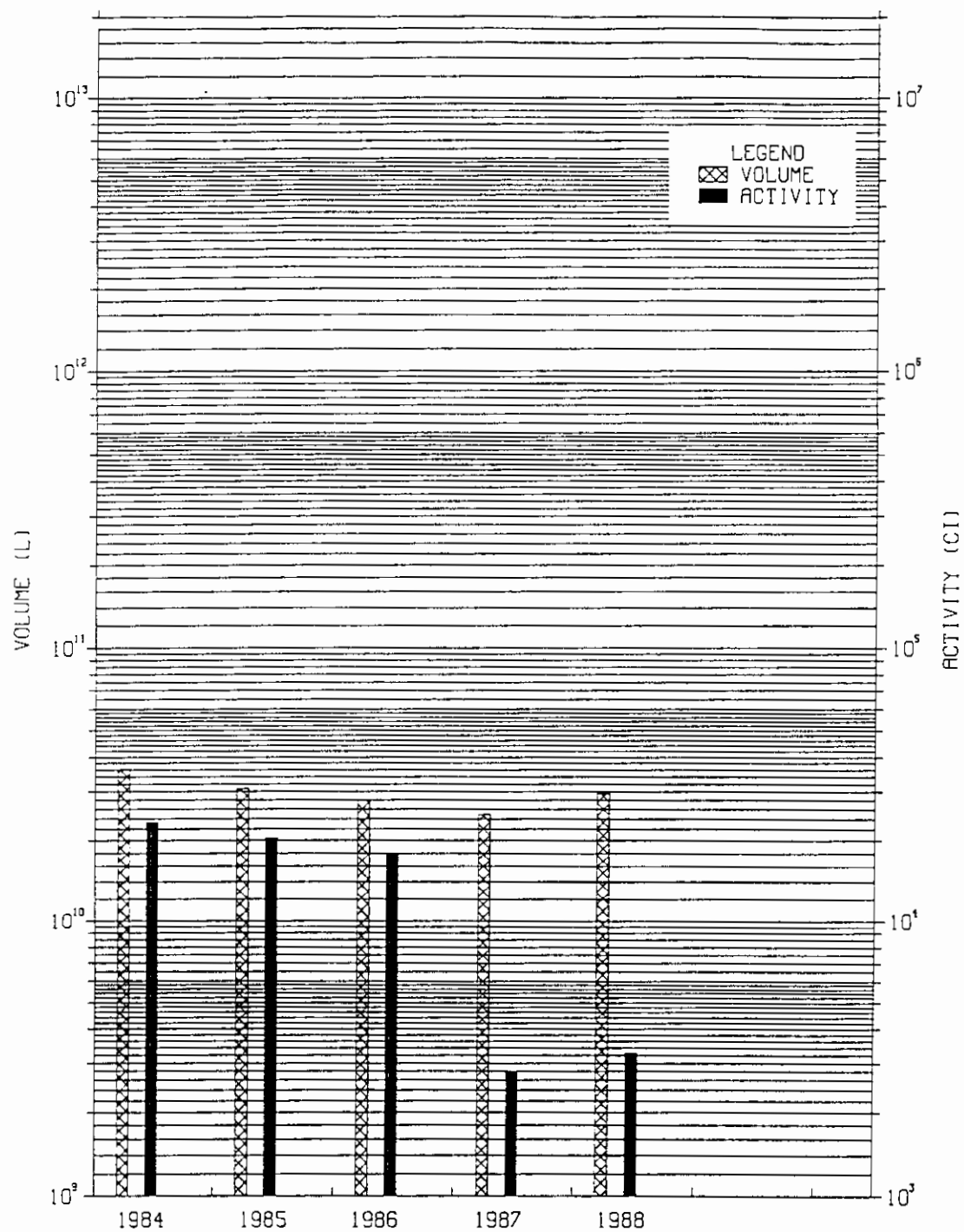


FIG. 41 TOTAL LIQUID EFFLUENT DISCHARGED FROM RICHLAND OPERATIONS.

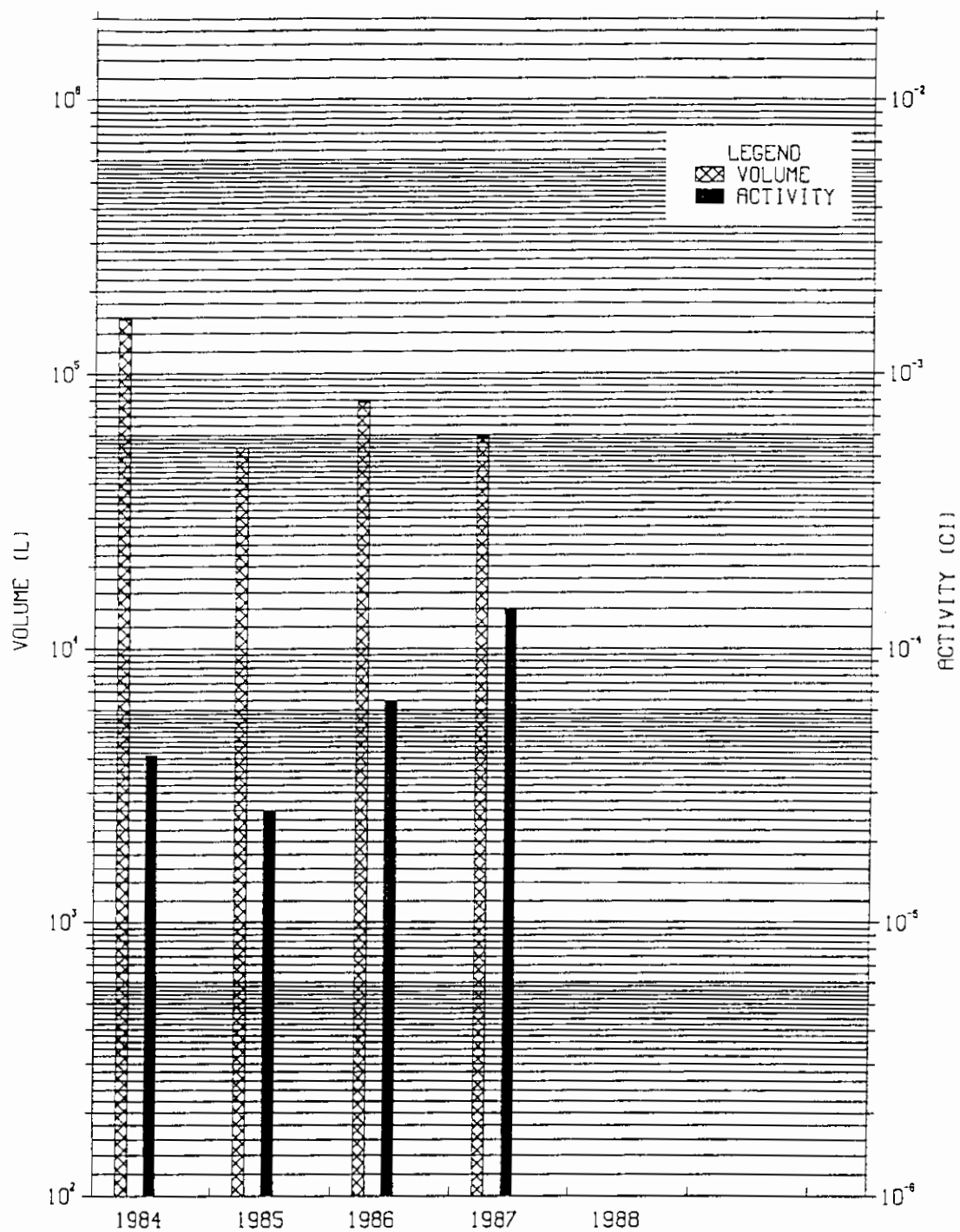


FIG. 42 TOTAL LIQUID EFFLUENT DISCHARGED FROM SAN FRANCISCO OPERATIONS.

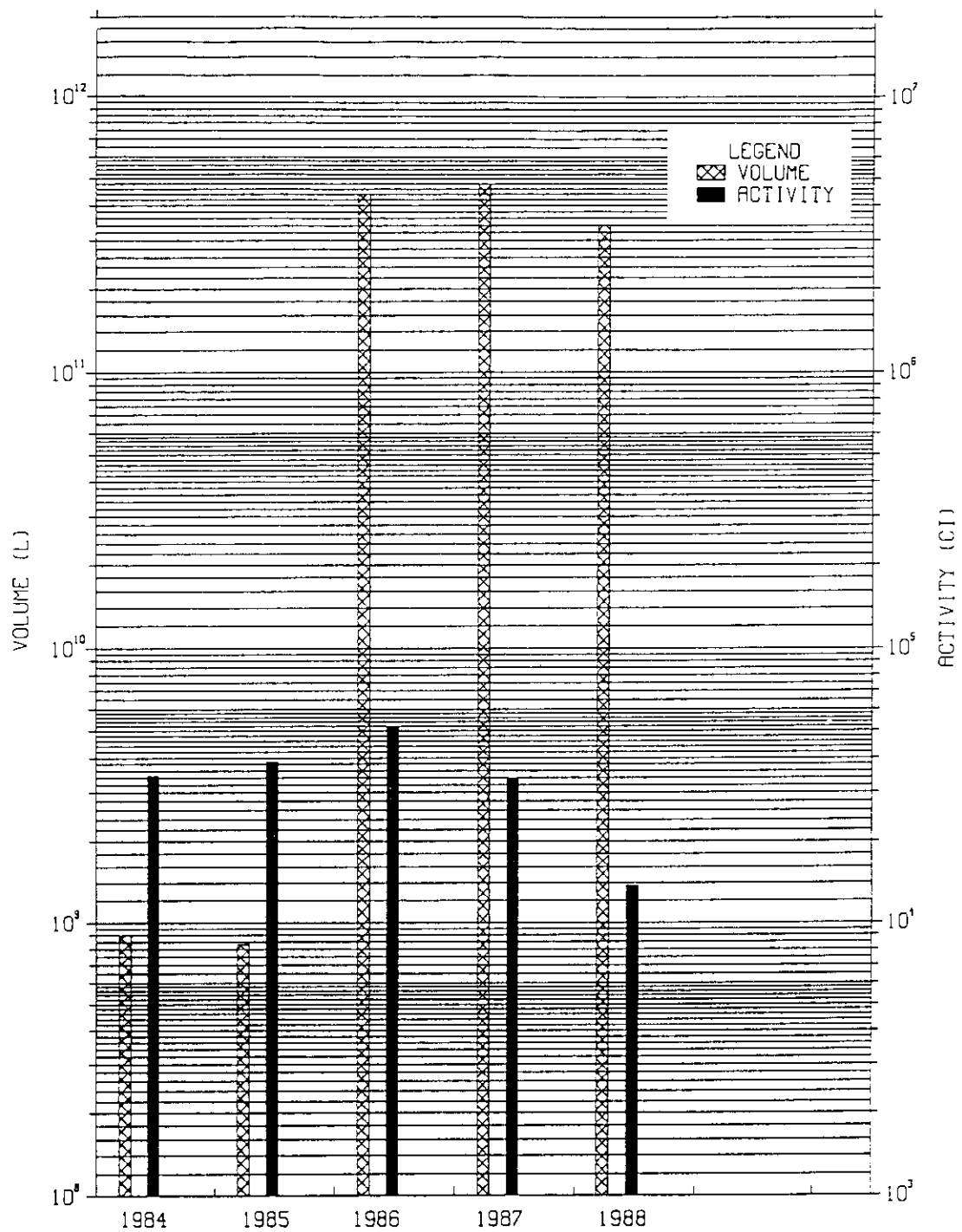


FIG. 43 TOTAL LIQUID EFFLUENT DISCHARGED FROM SAVANNAH R. OPERATIONS.

ONSITE DISCHARGE INFORMATION SYSTEM (ODIS)
TOTAL RADIOACTIVITY DISCHARGED

Figure 44 illustrates and Table VIII tabulates, by plant, the total CY 1988 discharges in amounts greater than 1 Ci. The points discharging the major amount of the radioactivity and the percent of the DOE total are: The E Tunnel (NTS) 20.46%, Test Reactor Area (INEL) 0.77%, White Oak Lake (Oak Ridge) 4.64%, Tank Farm (Richland) 2.00%, Purex Facility (Richland) 11.73%, F and H Separation (SRP) 56.14%, K-, L-, and P-Reactors (SRP) 3.25%.

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING ACTIVITY > 1.0 CI

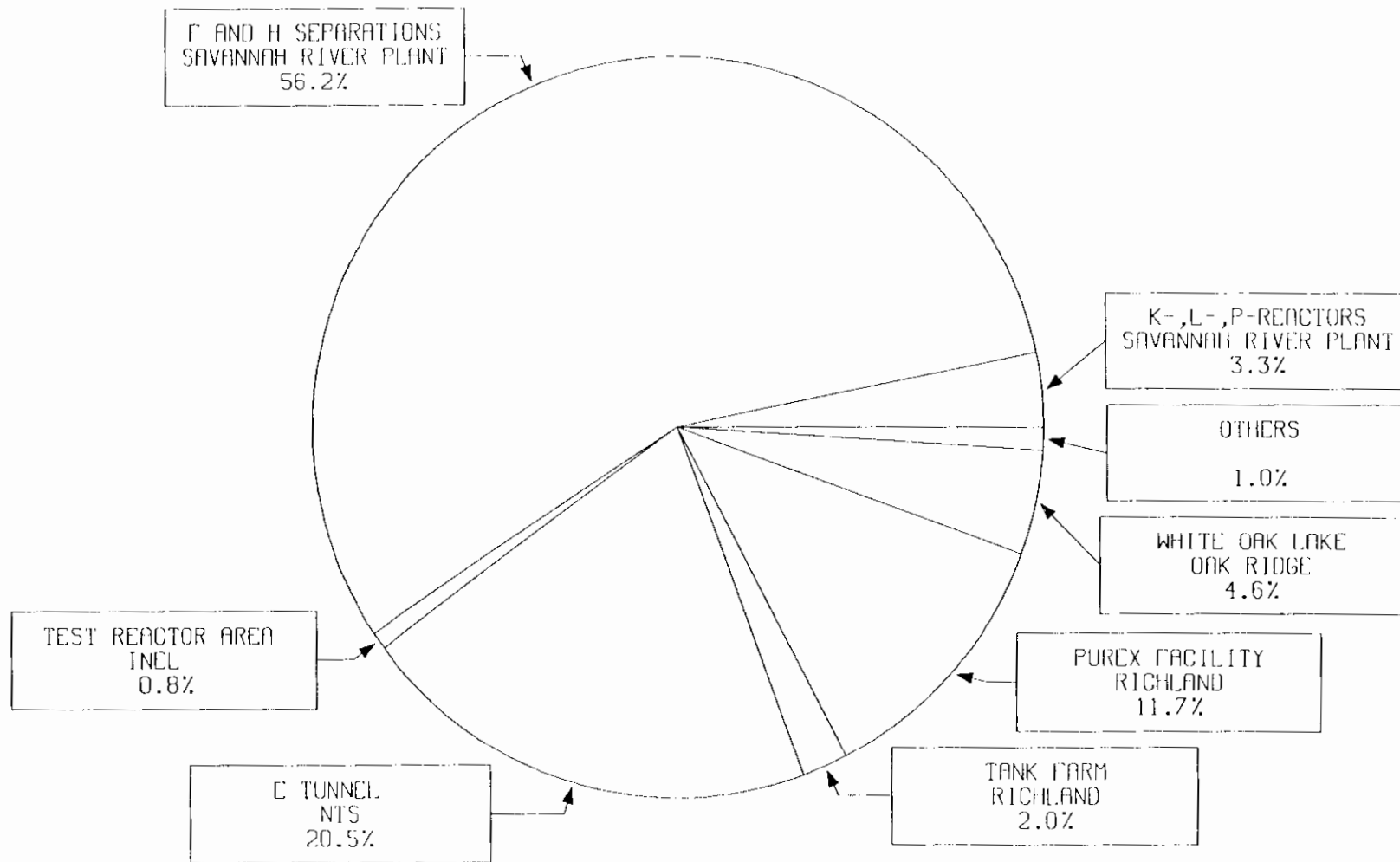


FIGURE 44

TABLE VIII

DISCHARGE POINTS DISCHARGING >1 Ci of RADIOACTIVITY DURING CY 1988 - ODIS

Operations Office	Area	Discharge Point	Curies	Percent of DOE Total Radioactivity Discharged
AL	LANL	1A-50 Liquid Waste Treatment Plant	21.12	0.091
AL	LANL	TA-53-166 Sanitary Lagoon Overflow	4.96	0.021
ID	INEL	CFA Hot Laundry Facility	1.08	0.005
ID	INEL	TRA Facility	178.10	0.77
ID	INEL	Idaho Chemical Processing Plant	89.37	0.386
NV	NTS	E Tunnel	4,735.0	20.46
OR	ORNL	White Oak Lake	1,073.0	4.64
RL	200 East	Tank Farm Facility	463.9	2.00
RL	200 East	Purex Facility	2,715.0	11.73
RL	200 West	U Plant Facility	11.0	0.048
RL	N Reactor	N Reactor	94.18	0.41
SR	Savannah	F-Area Separations Plant	1.86	0.008
SR	Savannah	F and H Separations	12,990.0	56.14
SR	Savannah	H-Area Separations Plant	5.02	0.022
SR	Savannah	K-Reactor Plant	112.6	0.49
SR	Savannah	L-Reactor Plant	231.8	1.00
SR	Savannah	P-Reactor Plant	408.5	1.76
		All other 49 discharge points	<u>3.51</u>	.02
		TOTAL	23,140.0	

ONSITE DISCHARGE INFORMATION SYSTEM (ODIS)
SELECTED NUCLIDE DISCHARGES

Figures 45 through 57 illustrate and Table IX tabulates CY 1988 discharges of preselected radioisotopes by plant. The reported plants were those that discharged activity greater than a preset level of a preselected radioisotope. The radionuclides and the significant level of radioactivity were preselected by DOE-Headquarters Operational and Environmental Safety Division (OES).

Of all plants discharging ^{241}Am activity greater than 0.0001 Ci per year in 1988: 200 West (Richland) discharged 4.2%, 200 East (Richland) discharged 95.2%, Savannah River Plant discharged 0.3%, and Los Alamos National Laboratory discharged 0.3%.

Of all plants discharging ^{60}Co activity greater than 0.1 per year in 1988: N Reactor Plant discharged 99.8%, and TRA (INEL) discharged 1.2%.

Of all plants discharging ^{137}Cs activity greater than 0.1 Ci per year in 1988: 200 East (Richland) discharged 9.3%, N Reactor Plant discharged 49.8%, Savannah River Plant discharged 38.7%, and Idaho Chemical Processing Plant (INEL) discharged 0.7%.

Of plants discharging ^3H activity greater than 100 Ci per year in 1988: Savannah River Plant discharged 59.9%, 200 East (Richland) discharged 13.9%, Nevada Test Site discharged 20.8%, White Oak Lake (Oak Ridge) discharged 4.7%, and TRA (INEL) discharged 0.8%.

Of all plants discharging halogen activity greater than 0.1 Ci per year in 1988: There were no plants that discharged halogen activity that exceeded this level of activity.

Of all plants discharging plutonium activity greater than 0.0001 Ci per year in 1988: 200 East (Richland) discharged 82.6%, N Reactor Plant discharged 7.4%, 200 West (Richland) discharged 7.8%, Savannah River Plant discharged 0.8%, Idaho Chemical Processing Plant discharged 0.7%, and Los Alamos National laboratory discharged 0.6%.

Of all plants discharging ^{238}Pu activity greater than 0.0001 Ci per year in 1988: N Reactor Plant discharged 40.5%, Savannah River Plant discharged 25.0%, 200 East (Richland) discharged 9.5%, Los Alamos National Laboratory discharged 5.5%, and 200 West (Richland) discharged 19.5%.

Of all plants discharging ^{239}Pu activity greater than 0.001 Ci per year in 1988: Los Alamos National Laboratory discharged 6.6%, Savannah River Plant discharged 2.1%, and N Reactor Plant discharged 91.3%.

Of all plants discharging ^{90}Sr activity greater than 0.1 Ci per year in 1988: 200 East (Richland) discharged 74.9%, and White Oak Lake (Oak Ridge) discharged 25.1%.

Of all plants discharging ^{99}Tc activity greater than 0.1 per year in 1988: Paducah Gaseous Diffusion Plant discharged 100.%.

Of all plants discharging uranium in amounts greater than 10 lb per year in 1988: Savannah River Plant discharged 27.7%, Rocky Flats Plant discharged 2.5%, Oak Ridge Gaseous Diffusion Plant discharged 57.7%, and Paducah Gaseous Diffusion Plant discharged 12.1%.

Of all plants discharging unidentified-alpha activity greater than 0.001 Ci per year in 1988: 200 East (Richland) discharged 74.5%, 200 West (Richland) discharged 3.4%, and Savannah River Plant discharged 22.2%.

Of all plants discharging unidentified-beta and gamma activity greater than 0.001 Ci per year in 1988: 200 East (Richland) discharged 98.3%, Savannah River Plant discharged 0.2%, and 200 West (Richland) discharged 1.5%.

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING AM-241 > 0.0001 CI IN LIQUID

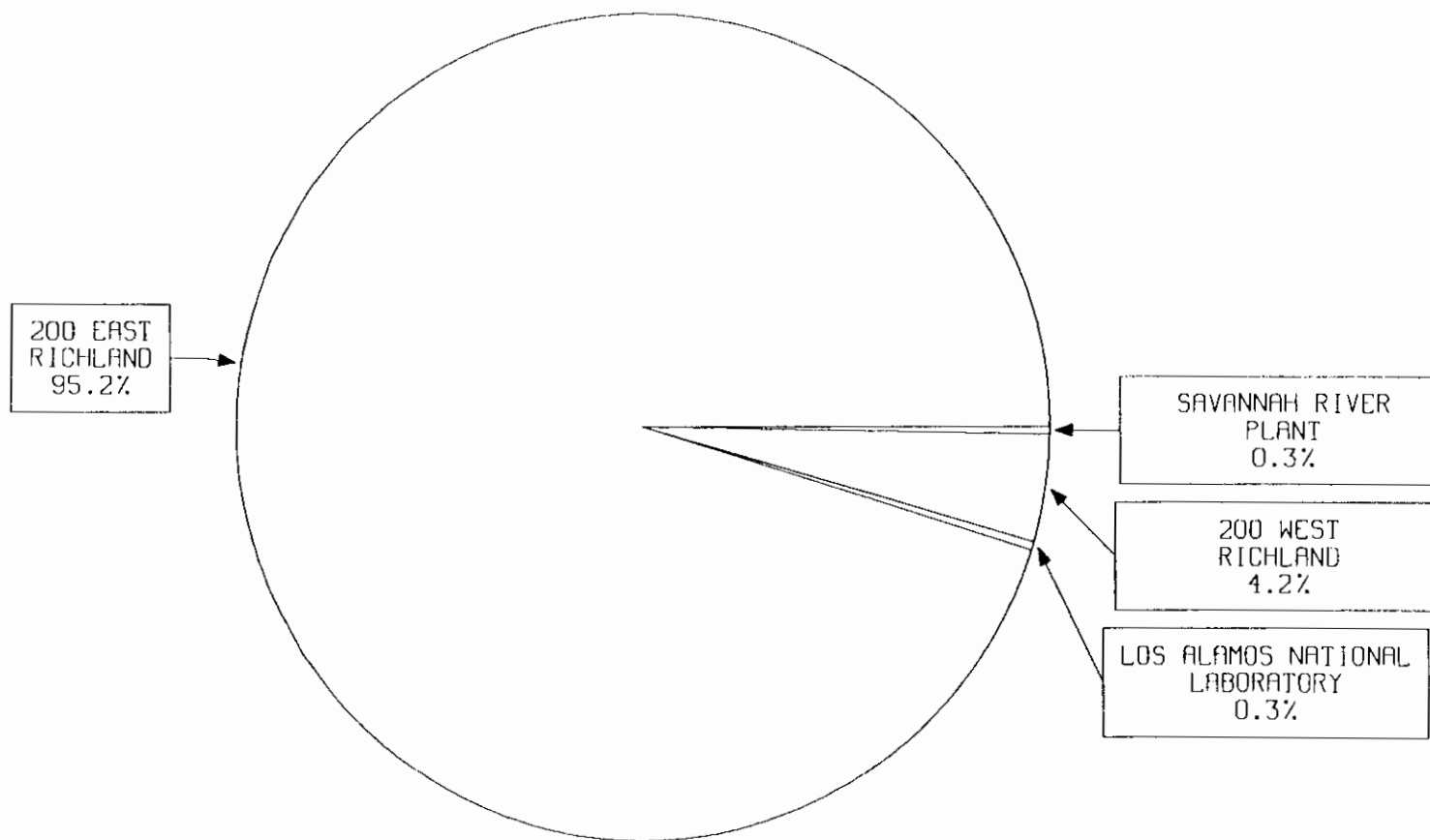


FIGURE 45

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING CO-60 > 0.1 CI IN LIQUID

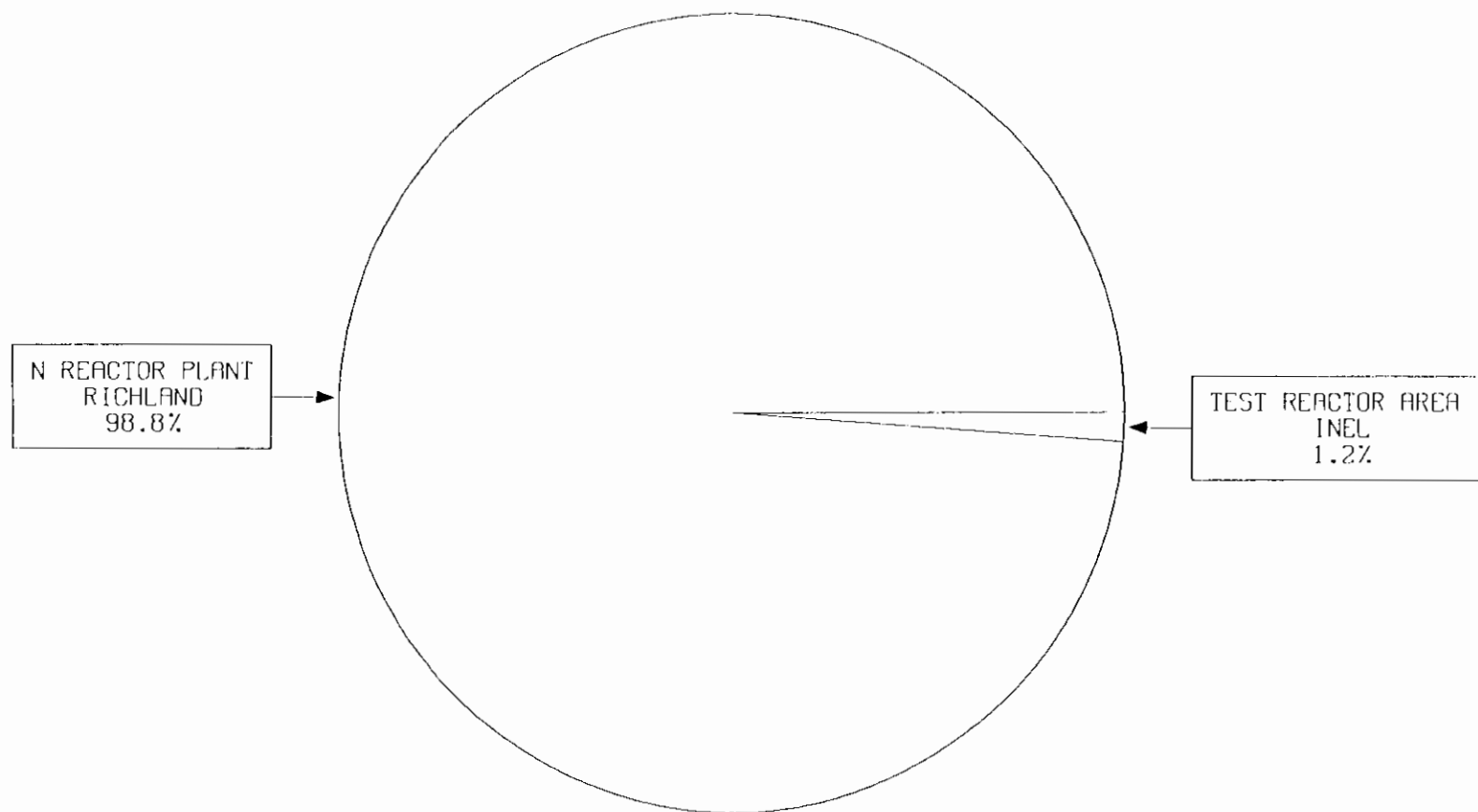


FIGURE 46

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING CS-137 > 0.1 CI IN LIQUID

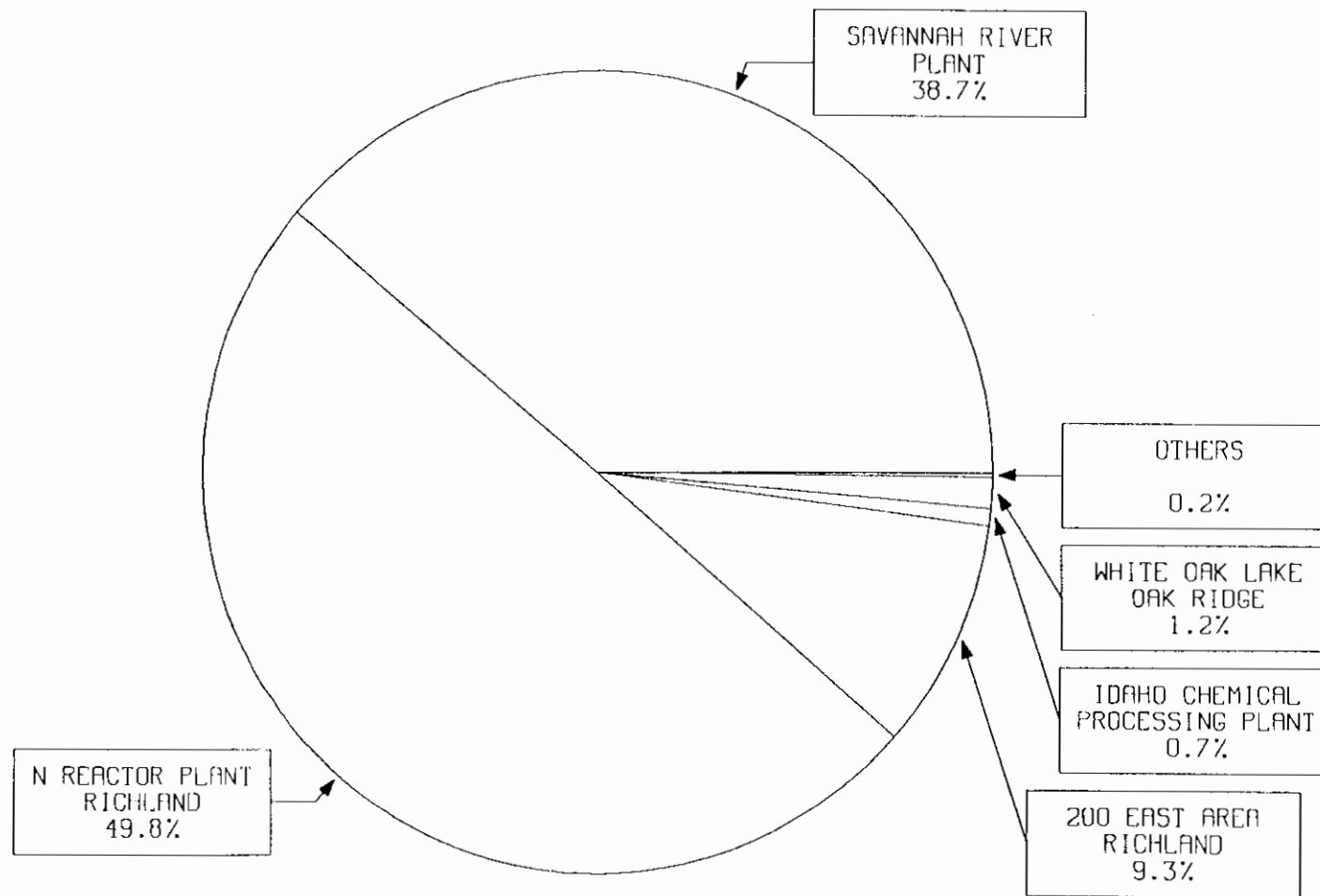


FIGURE 47

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING H-3 > 100 CI IN LIQUID

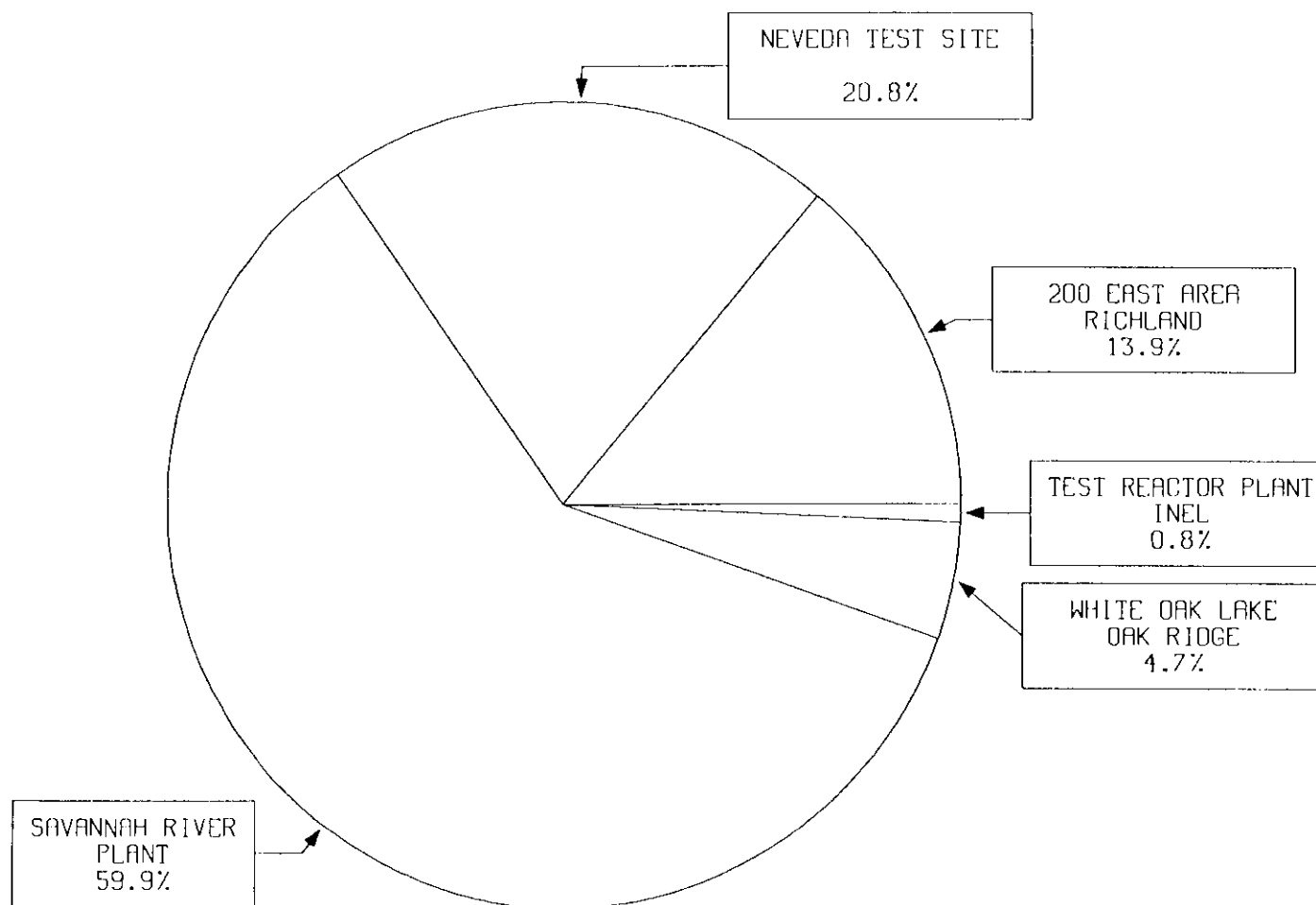


FIGURE 48

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING HALOGENS > 0.1 CI IN LIQUID

ALL DISCHARGES BELOW THIS LIMIT IN CY88

FIGURE 49

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING PU > 0.0001 CI IN LIQUID

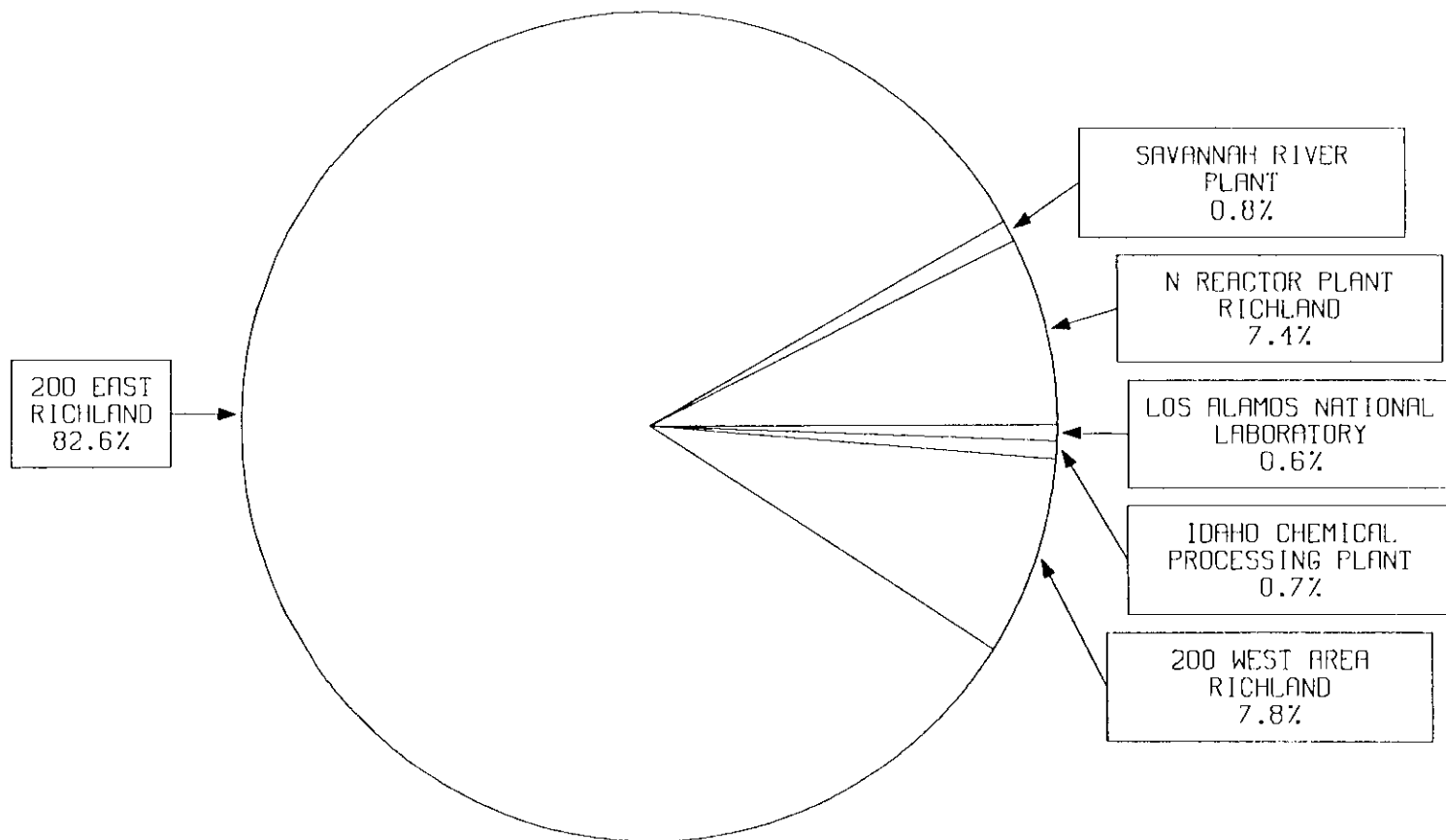


FIGURE 50

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING PU-238 > 0.0001 CI IN LIQUID

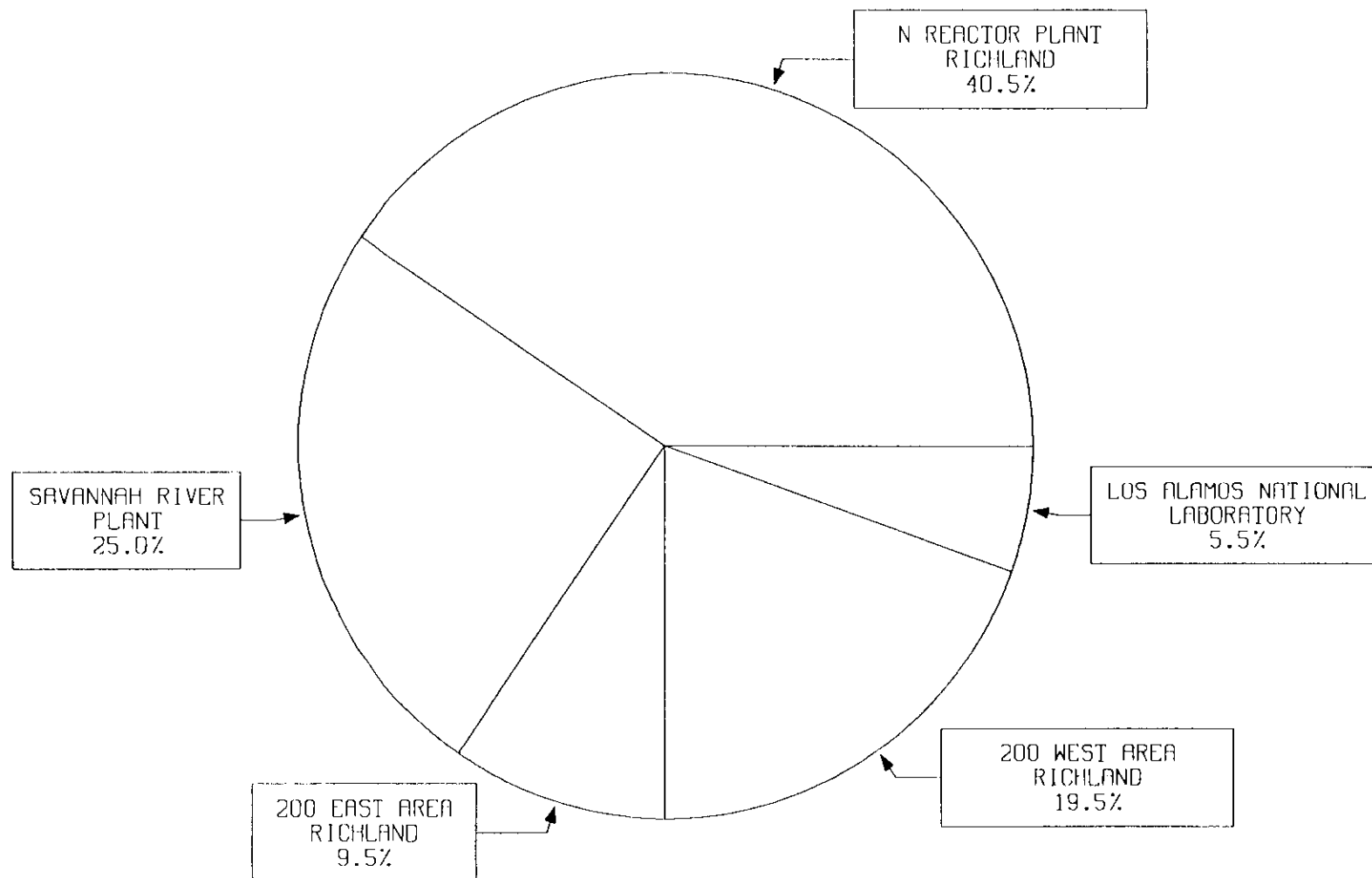


FIGURE 51

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING PU-239 > 0.0001 CI IN LIQUID

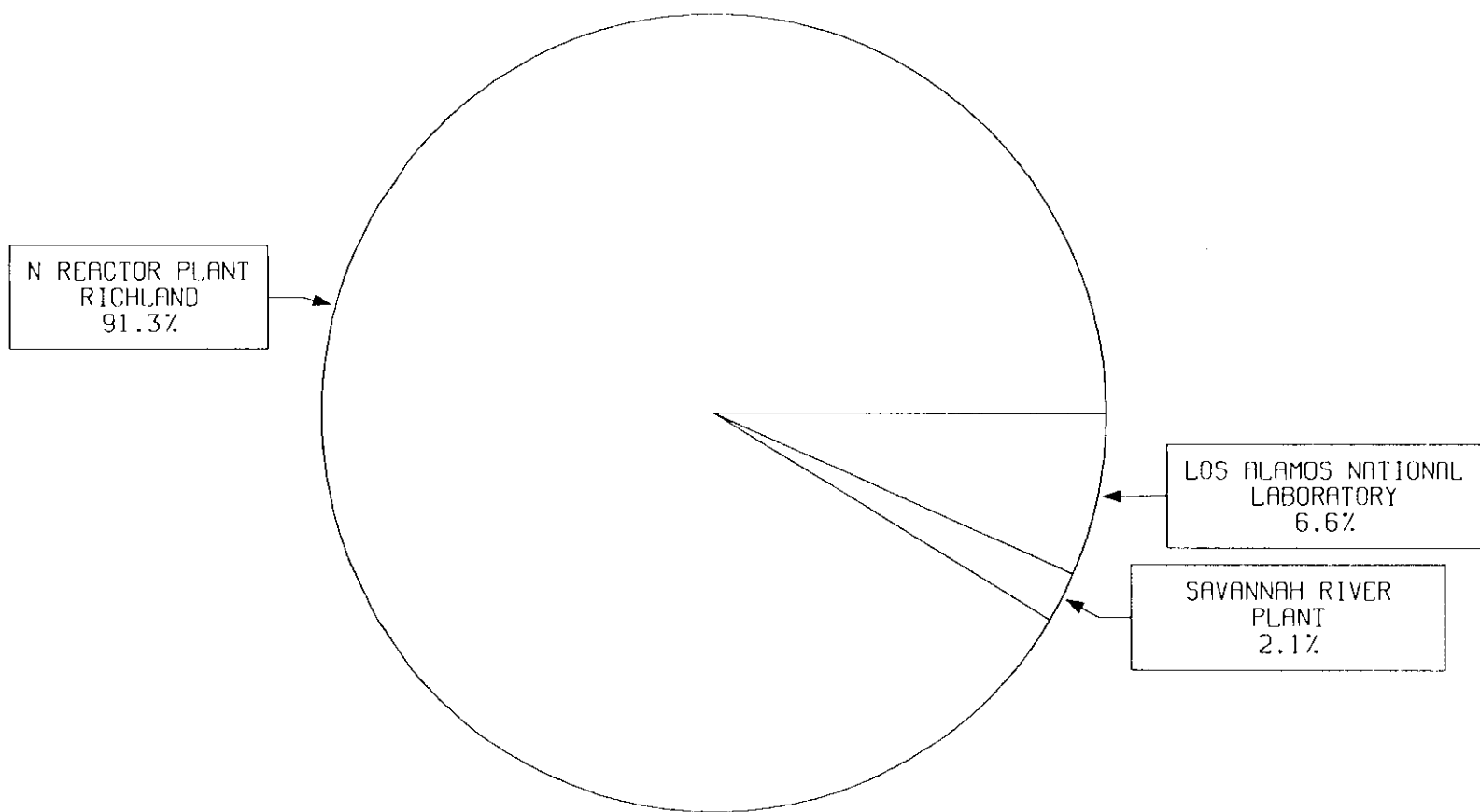


FIGURE 52

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING SR-90 > 0.1 CI IN LIQUID

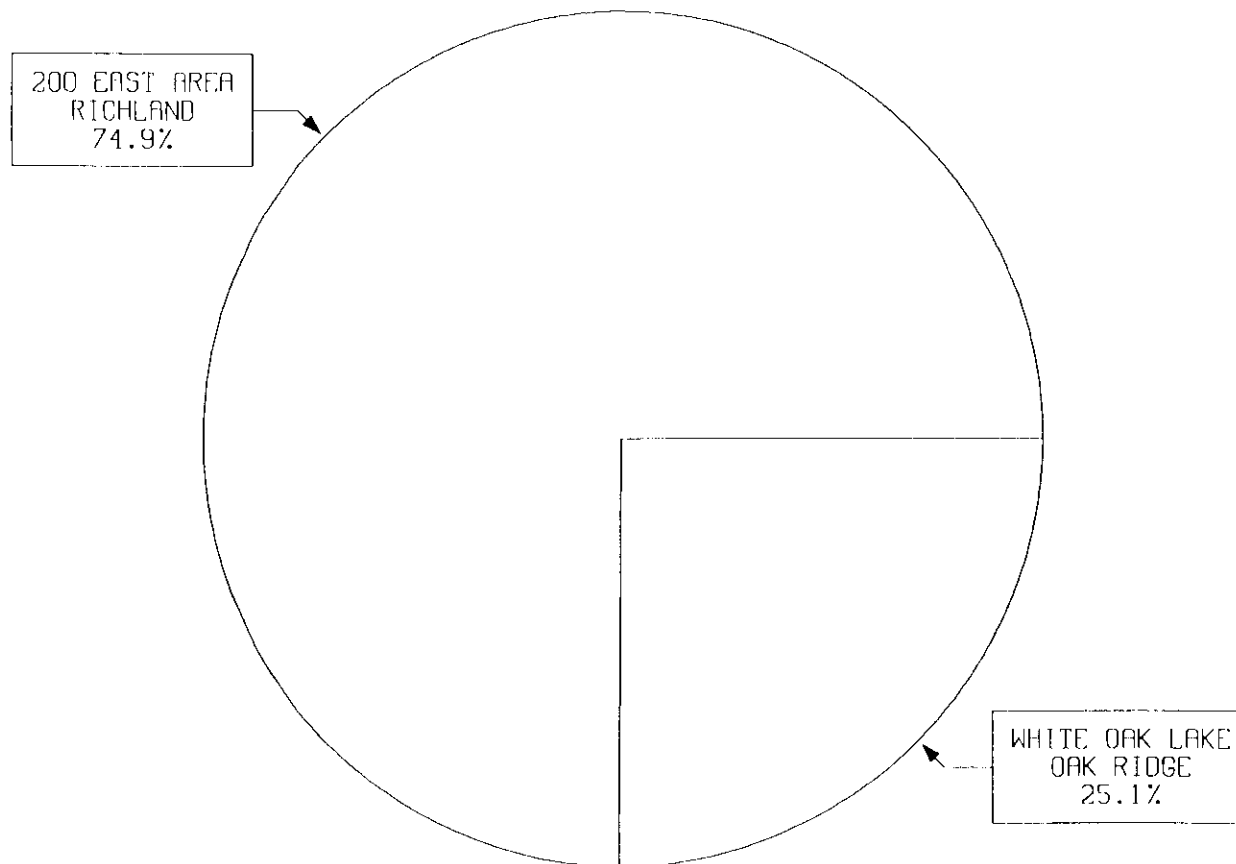


FIGURE 53

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING TC-99 > 0.1 CI IN LIQUID

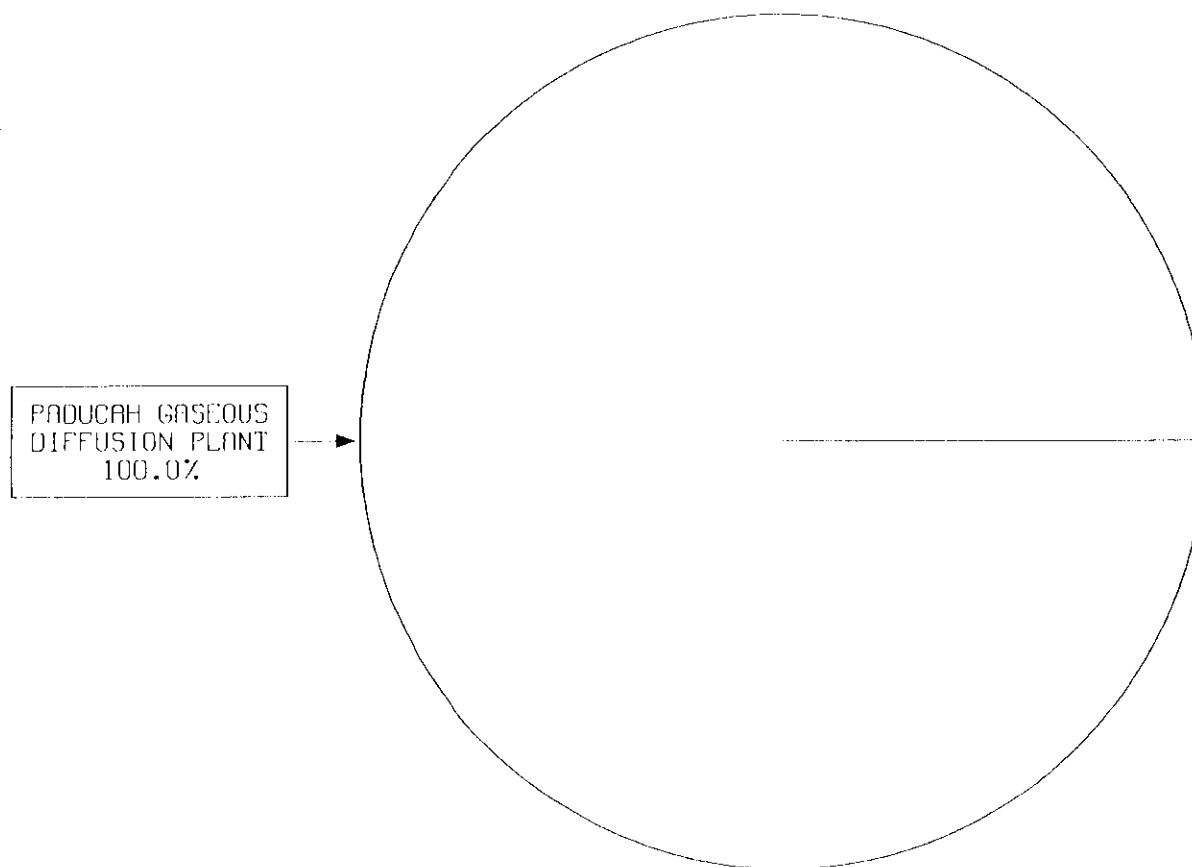


FIGURE 54

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING URANIUM IN AMOUNTS > 10 LB IN LIQUID

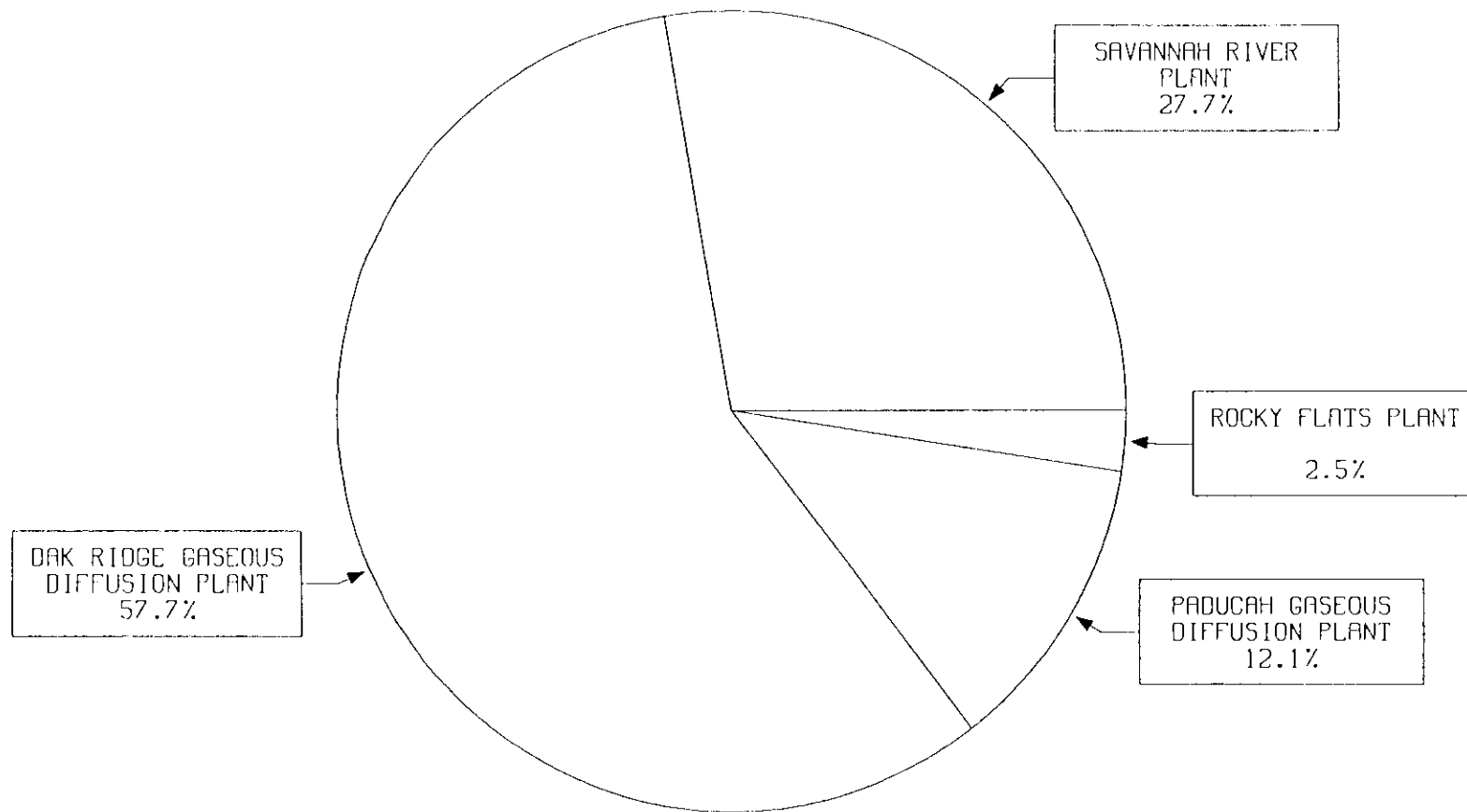


FIGURE 55

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING UNIDENTIFIED ALPHA > 0.001 CI
IN LIQUID

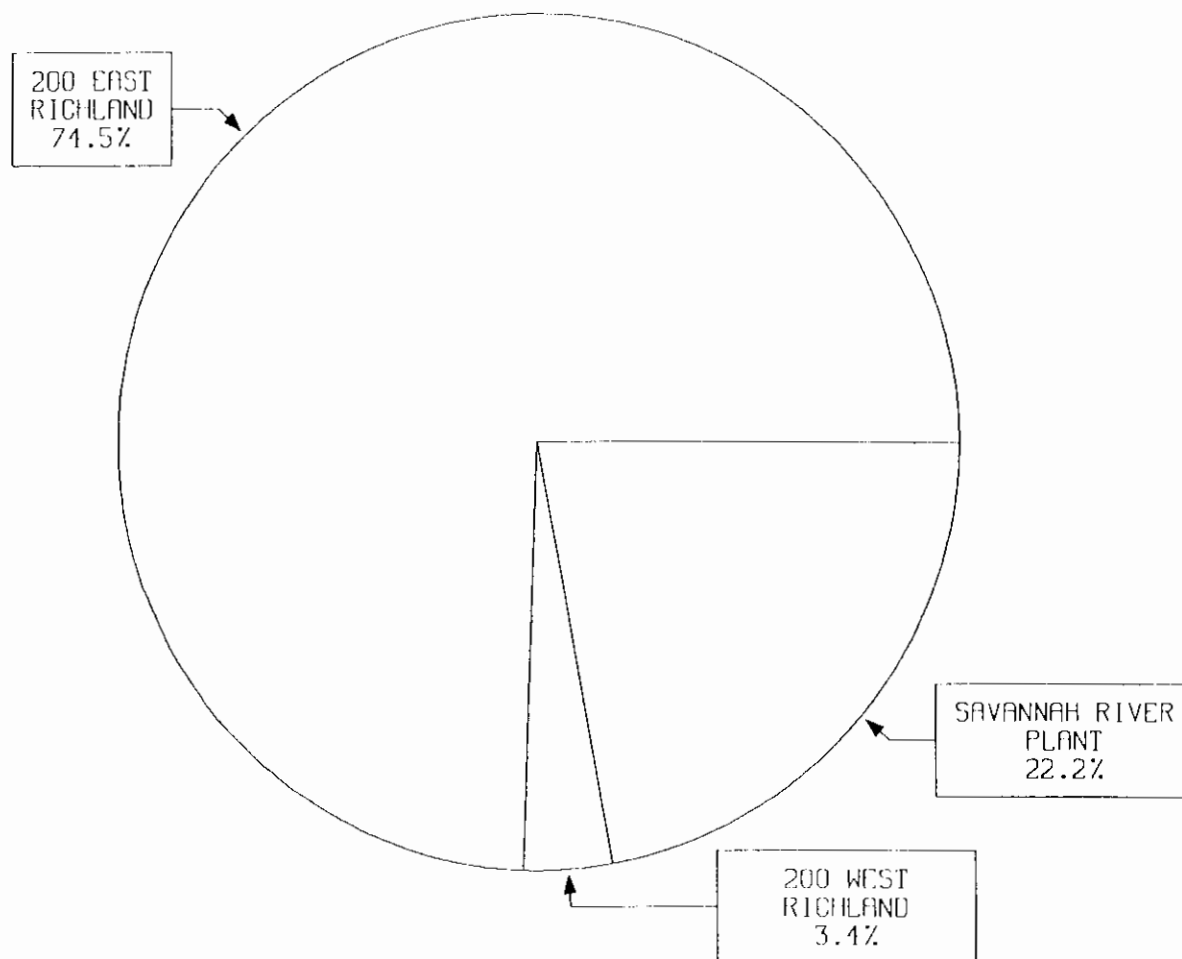


FIGURE 56

PERCENT OF TOTAL DOE DISCHARGES IN CY88
FOR PLANTS DISCHARGING UNIDENTIFIED B & G > 0.001 CI
IN LIQUID

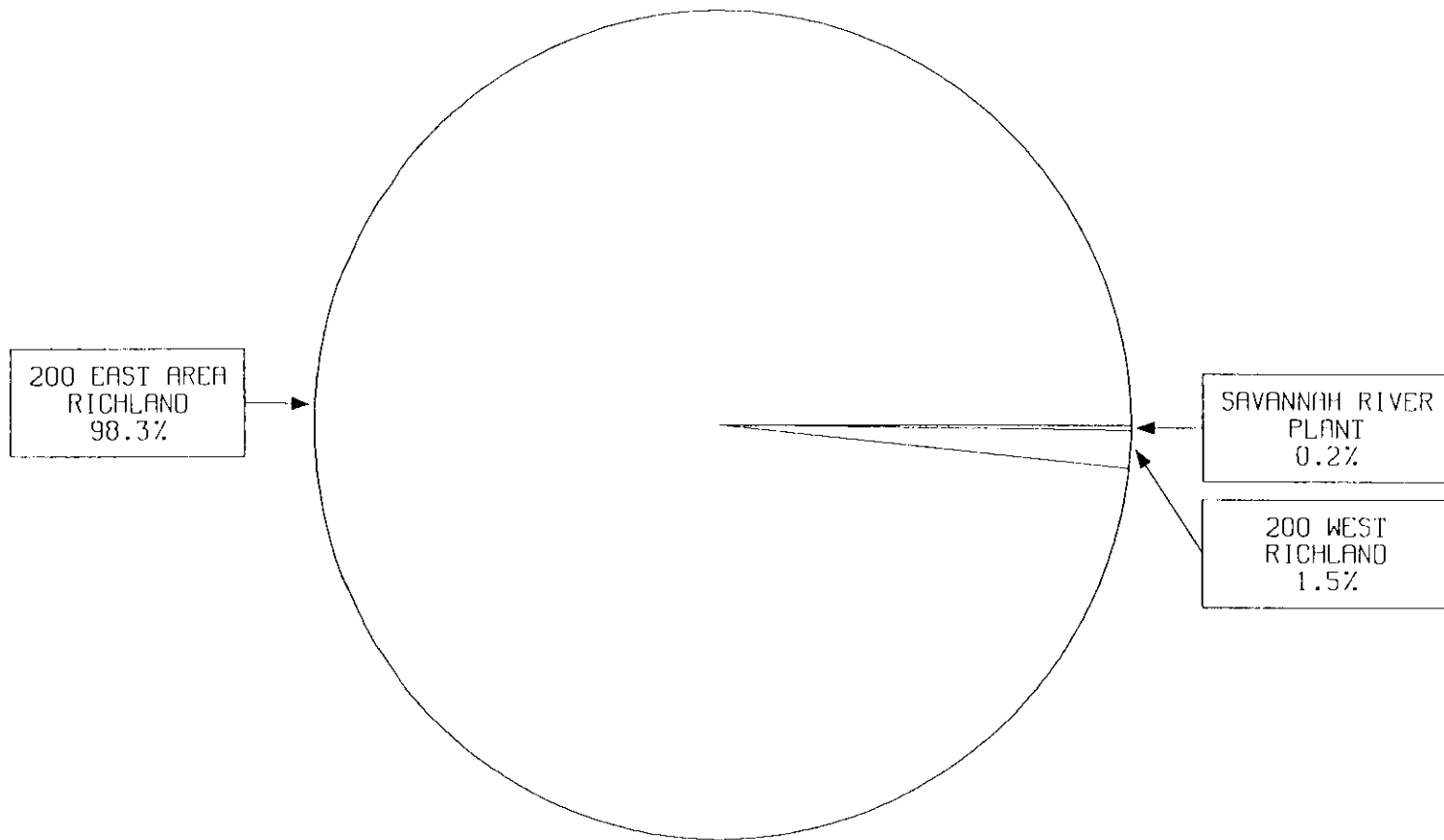


FIGURE 57

TABLE IX

ISOTOPIC DISCHARGE SUMMARY REPORT - ODIS
(CY 1988)

<u>Operations Office</u>	<u>Plant</u>	<u>Number of Discharge Points</u>	<u>Curies</u>
<u>Plants Discharging >0.0001 Ci of ^{241}Am</u>			
AL	Rocky Flats Plant	1	0.0001
AL	Los Alamos National Laboratory	1	0.0037
RL	200 East	4	1.0631
RL	200 West	5	0.0472
SR	Savannah River Plant	<u>2</u>	<u>0.0030</u>
	TOTALS	13	1.1171
<u>Plants Discharging >0.0001 Ci of ^{244}Cm</u>			
SR	Savannah River Plant	<u>1</u>	<u>0.0030</u>
	TOTALS	1	0.0030
<u>Plants Discharging >0.1 Ci of ^{60}Co</u> (includes ^{60}Co and ^{58}Co)			
ID	Test Reactor Area	1	0.1324
RL	N Reactor Plant	<u>1</u>	<u>11.0000</u>
	TOTALS	2	11.1324

TABLE IX (cont'd)

<u>Operations Office</u>	<u>Plant</u>	<u>Number of Discharge Points</u>	<u>Curies</u>
<u>Plants Discharging 0.1 Ci of ^{137}Cs</u> (includes ^{137}Cs and $^{134}, ^{137}\text{Cs}$)			
ID	Idaho Chemical Processing Plant	1	0.1134
OR	Oak Ridge National Laboratory	1	0.2000
RL	200 East	1	1.5000
RL	N Reactor Plant	1	8.0000
SR	Savannah River Plant	<u>2</u>	<u>6.2550</u>
	TOTALS	6	16.0684
<u>Plants Discharging >100 Ci of ^3H</u>			
ID	Test Reactor Area	1	172
NV	Nevada Test Site	3	4,734
OR	Oak Ridge National Laboratory	1	1,070
RL	200 East	3	3,158
SR	Savannah River Plant	<u>4</u>	<u>13,658</u>
	TOTALS	12	22,792
<u>Plants Discharging >0.1 Ci of Halogens</u> (includes halogens and all iodine isotopes)			
None reported in CY88		<u>0</u>	<u> </u>
	TOTALS	0	

TABLE IX (cont'd)

<u>Operations Office</u>	<u>Plant</u>	<u>Number of Discharge Points</u>	<u>Curies</u>
<u>Plants Discharging >0.0001 Ci of Pu</u> (includes all Pu isotopes)			
AL	Rocky Flats Plant	1	0.0001
AL	Los Alamos National Laboratory	1	0.0043
ID	Idaho Chemical Processing Plant	1	0.0050
RL	200 East	4	0.5804
RL	200 West	4	0.0547
RL	N Reactor Plant	1	0.0521
SR	Savannah River Plant	<u>2</u>	<u>0.0060</u>
	TOTALS	14	0.7025
<u>Plants Discharging >0.0001 Ci of ²³⁸Pu</u>			
AL	Los Alamos National Laboratory	1	0.0011
RL	200 East	1	0.0019
RL	200 West	1	0.0039
RL	N Reactor Plant	1	0.0081
SR	Savannah River Plant	<u>2</u>	<u>0.0050</u>
	TOTALS	6	0.0200

TABLE IX (cont'd)

<u>Operations Office</u>	<u>Plant</u>	<u>Number of Discharge Points</u>	<u>Curies</u>
<u>Plants Discharging >0.0001 Ci of ^{239}Pu</u>			
AL	Los Alamos National Laboratory	1	0.0032
RL	N Reactor Plant	1	0.0440
SR	Savannah River Plant	<u>1</u>	<u>0.0010</u>
	TOTALS	3	0.0482
<u>Plants Discharging >0.1 Ci of ^{90}Sr</u> (includes ^{90}Sr and ^{89}Sr)			
OR	Oak Ridge National Laboratory	1	0.2000
RL	200 East	<u>1</u>	<u>0.5970</u>
	TOTALS	2	0.7970
<u>Plants Discharging >0.1 Ci of ^{99}Tc</u>			
OR	Paducah Gaseous Diffusion Plant	<u>1</u>	<u>0.4088</u>
	TOTALS	1	0.4088

TABLE IX (cont'd)

<u>Operations Office</u>	<u>Plant</u>	<u>Number of Discharge Points</u>	<u>Curies</u>
<u>Plants Discharging >10 lb of U</u> (includes all U isotopes)			(lb)
AL	Rocky Flats Plant	1	13
OR	Oak Ridge Gaseous Diffusion Plant	3	304
OR	Paducah Gaseous Diffusion Plant	1	64
OR	Feed Material Production Center (Fernald)	0	0
SR	Savannah River Plant	<u>1</u>	<u>146</u>
	TOTALS	6	527
<u>Plants Discharging >0.001 Ci of Unidentified Alpha</u>			
RL	200 East	4	0.1210
RL	200 West	2	0.0055
SR	Savannah River Plant	<u>2</u>	<u>0.0360</u>
	TOTALS	8	0.1625
<u>Plants Discharging >0.001 Ci of Unidentified Beta and Gamma</u>			
RL	200 East	7	3.1757
RL	200 West	5	0.0478
SR	Savannah River Plant	<u>3</u>	<u>0.0065</u>
	TOTALS	15	3.2300

TABLE X
SUMMARY OF ONSITE RADIOACTIVE LIQUID DISCHARGES - ODIS
(CY 1988)

<u>Operations Office</u>	<u>Liquid</u>	
	<u>Volume (L)</u>	<u>Radioactivity (Ci)</u>
Albuquerque	3.997E+08	2.631E+01
San Francisco	(None)	(None)
Chicago	1.283E+07	1.446E+00
Idaho	2.353E+09	2.686E+02
Nevada	1.309E+09	4.735E+03
Oak Ridge	1.754E+09	1.071E+03
Richland	2.970E+10	3.285E+03
Savannah River	<u>3.415E+11</u>	<u>1.375E+04</u>
DOE TOTALS	3.770E+11	2.314E+04

TABLE XI

CUMULATIVE INVENTORIES IN ACTIVE STORAGE/DISPOSAL FACILITIES (SDF)
(Decayed to 12/31/88)

	<u>Nuclide</u>	<u>Total Cumulative Curies</u>
<u>Albuquerque</u>		
Lovelace ITRI		
Hot Ponds	^{239}Pu	0.013
Rocky Flats Operations		
Plant Buffer Zone & Atmosphere	^3H	0.080
Pond A-2	^3H	0.025
	^{239}Pu	0.026
B-Series Holding Pond	^3H	0.295
	^{239}Pu	0.015
Pond B-2	^{239}Pu	0.091
	^3H	0.008
Los Alamos National Laboratory		
Intermittent Stream in DP Canyon	^3H	22.429
	^{239}Pu	0.033
Mortandad Canyon	^3H	216.192
	^{239}Pu	0.165
R-Site Firing Points	^3H	15,801.09
Pinellas		
Northeast Lake	^3H	4.241
Northwest Lake	^3H	3.061
Spray Irrigation Field	^3H	2.299

TABLE XI (Cont'd)

	<u>Nuclide</u>	<u>Total Cumulative Curies</u>
<u>Chicago</u>		
Argonne National Laboratory-West		
Industrial Waste Pond Facility No. 746	^3H	0.798
National Accelerator Laboratory		
Booster Pond	^3H	0.004
Main Ring Ponds	^3H	0.002
Ditch West of Proton West	^3H	0.014
Ditch West of Target Hall	^3H	2.101
Ditch East of Meson Area	^3H	0.321
Ditch West of Proton Area	^3H	0.875
<u>Idaho</u>		
Central Facilities Area Sewage Treatment Facility		
Sewage Tile Field	^3H	12.548
Test Area North		
Aquifer	^3H	3.248
Evaporation Pond	^3H	4.381
Special Power Excursion Reactor Test-Power Burst Facility		
Ground Water Through PBF Shallow Well	^3H	0.011
Test Reactor Area		
TRA Leaching Pond	^3H	2,789.92

TABLE XI (Cont'd)

	<u>Nuclide</u>	<u>Total Cumulative Curies</u>
<u>Idaho (Cont'd)</u>		
Idaho Chemical Processing Plant		
ICPP Injection Well	^3H	3,225.379
	^{239}Pu	0.045
CPP Filtration Pond	^3H	9.635
<u>Nevada</u>		
Project Rio Blanco		
Sands at Depth 5600-6072 ft Subsurface	^3H	144.378
Nevada Test Site		
Yucca Lake Decontamination Waste Pond	^3H	0.875
Haines Lake	^3H	991.581
Ground Percolation 3R	^3H	123.731
Ground Percolation 4R	^3H	79.745
Evaporation Reservoirs at Well Site	^3H	271.87
Well RNM-2S Basin	^3H	5,972.59
<u>Oak Ridge</u>		
Oak Ridge Gaseous Diffusion Plant		
K-1407-B Holding Pond	^{239}Pu	0.001
Oak Ridge National Laboratory		
Injection Well at Hydrofracture Facility	^{239}Pu	5.632
Oak Ridge Y-12 Plant		
S-3-Acid Ponds	^{239}Pu	0.006

TABLE XI (Cont'd)

	<u>Nuclide</u>	<u>Total Cumulative Curies</u>
<u>Oak Ridge (Continued)</u>		
Feed Materials Production Center		
Pit 3 & 5	^{239}Pu	0.058
Paducah Gaseous Diffusion Plant		
Diversion Ditch to C-616 Full Flow Lagoon	^{239}Pu	0.004
<u>Pittsburgh</u>		
Naval Reactors Facility - INEL		
NRF-720 Seepage Basin	^3H	0.525
<u>Richland</u>		
200 East		
216-A-3 Crib	^{239}Pu	0.012
216-A-8 Crib	^3H	62.183
	^{239}Pu	3.070
216-A-10 Crib	^{239}Pu	21.370
216-A-30 Crib	^{239}Pu	4.487
	^3H	0.049
216-A-37 Crib	^3H	60.609
216-B-55 Crib	^3H	2.787
	^{239}Pu	0.040
216-B-62 Crib	^3H	25.041
	^{239}Pu	0.046
216-C-7 Crib	^{239}Pu	0.068
216-A-25 Pond	^3H	47.779
	^{239}Pu	26.232

TABLE XI (Cont'd)

	<u>Nuclide</u>	<u>Total Cumulative Curies</u>
<u>Richland (Cont'd)</u>		
216-B-3 Pond	^3H	13.063
	^{239}Pu	15.322
216-B-63 Trench	^3H	2.338
	^{239}Pu	0.035
200 West		
216-S-25 Crib	^3H	152.012
	^{239}Pu	0.003
216-Z-16 Crib	^{239}Pu	4.394
216-W-LWC Crib	^{239}Pu	0.029
216-Z-20 Crib	^{239}Pu	0.009
216-S-11 Pond	^3H	0.010
	^{239}Pu	0.019
216-S-19 Pond	^3H	0.210
	^{239}Pu	1.264
216-T-1 Ditch	^{239}Pu	0.006
216-T-4 Pond	^{239}Pu	0.227
216-U-10 Pond	^3H	5.069
	^{239}Pu	504.364
216-T-19 Tile Field	^3H	40.030
	^{239}Pu	0.881
N Reactor Plant		
Soil Column To Ground Water	^3H	1,532.18
	^{239}Pu	7.648

TABLE XI (Cont'd)

	<u>Nuclide</u>	<u>Total Cumulative Curies</u>
<u>Savannah River</u>		
Savannah River Plant		
F and H Seepage Basin	^3H	206,890.38
F Area Seepage basin	^{239}Pu	5.602
H Area Seepage Basin	^{239}Pu	1.954
P Reactor Plant	^3H	26,802.45
L Reactor	^3H	2,315.85
K Reactor	^3H	1,336.22
C Reactor	^3H	25,074.56
700 Area Seepage Basin	^3H	88.565
	^{239}Pu	0.003
Oil and Chemical Waste Pit (83G)	^3H	9,206.93
105-K Reactor 50 M Gal. Emergency Containment Basin	^3H	136,408.44